A Comprehensive Introduction to Nostratic Comparative Linguistics

With Special Reference To Indo-European

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Allan R. Bomhard

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With Special Reference To Indo-European

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By
Allan R. Bomhard

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By Allan R. Bomhard

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PREFACE

Reconstructing Proto-Nostratic:
Comparative Phonology, Morphology, and Vocabulary

Research on this book can truly be said to have begun some forty years ago, when I first began exploring the possibility that Indo-European might be related to Semitic. I published the on-going development of my ideas in a series of articles, beginning in 1975 (for details, see the list of my works cited in the references at the end of this book). As time went on, I gradually expanded the scope of the investigation to include all of Afroasiatic (in this book, I use "Afrasian" as the designation for this language family, in accordance with a proposal made by Igor M. Diakonoff). The culmination of this phase of my research resulted in the publication of my 1984 book *Toward Proto-Nostratic: A New Approach to the Comparison of Proto-Indo-European and Proto-Afroasiatic* (Amsterdam: John Benjamins). Over the many years that it took me to develop the ideas that led to that book, I received support and feedback from Raimo Anttila, Martin Bernal, Henrik Birnbaum, John Colarusso, Thomas Gamkrelidze, Paul Hopper, and Saul Levin. Through the whole process, the encouragement I received from my friend, colleague, and collaborator on the Kerns Gedenkschrift, Yoël L. Arbeitman, was a constant source of inspiration, and the careful scrutiny that he gave my work saved me from making many foolish errors. I owe much to Konrad Koerner for courageously agreeing to accept the book for publication, for his editorial advice, and for guiding the work through the publication process. Paul J. Hopper kindly prepared the Foreword to that book. Finally, I would like to acknowledge the much-needed assistance I received from El Rabih Makki, who carefully reviewed the Arabic material found in that book, and Gilbert Davidowitz — looking back, it is hard to believe that well over thirty years have passed since Davidowitz suffered a fatal heart attack (on 21 July 1980).

After the publication of *Toward Proto-Nostratic*, I had intended to leave distant linguistic comparison behind for a while and move into other areas of research, particularly Indo-European morphology and syntax, which I felt needed a new synthesis to reflect current views. However, this was not to happen. Reviews of my book as well as personal correspondence and discussions with colleagues prompted me to begin taking a look at other language families. Here, I owe much to Vitaly Shevoroshkin — had he not been so critical of many aspects of my work, I probably would not have been motivated to devote the better part of the next decade to doing painstaking research into other language families with which Indo-European might be genetically related, but I needed to see for myself whether or not my views could hold up when the field of inquiry was expanded, and I needed to see whether or not there was any basis for Shevoroshkin's criticisms. Needless to say, I was extremely pleased with what I found. And, as for Shevoroshkin, all I can say is "thank you, Vitaly". Though Shevoroshkin continues to support Moscovite views on Nostratic and to be critical of my views, on a personal basis, he has turned out to be a warm,

friendly, and generous individual, and I am glad that I have had the opportunity to get to know him and his wife, Galina.

Unfortunately, in spite of my best efforts to get my hands on a copy of Illič-Svityč's dictionary so that I could consult it in preparing *Toward Proto-Nostratic*, I was unsuccessful. When I finally received volumes I and II of Illič-Svityč's dictionary from Dolgopolsky (on 22 August 1983), the camera-ready manuscript of the book had already been sent to the publisher. To those who wondered why Illič-Svityč was not given more credit in my 1984 book, the answer should now be obvious — one cannot cite nor comment upon what one has not seen. This unfortunate shortcoming has since been rectified in my subsequent work.

In addition to expressing my deepest gratitude to Aharon Dolgopolsky for his great kindness and generosity in giving me copies of his and Illič-Svityč's articles on Nostratic as well as copies of volumes I and II of Illič-Svityč's comparative Nostratic dictionary, I would also like to thank my friend Yoël L. Arbeitman for sending me a copy of the first fascicle of volume III of Illič-Svityč's dictionary.

In October 1985, I had the good fortune to come into contact with, and eventually to meet, John C. Kerns, who had sent me a copy of his book *Indo-European Prehistory*. When I read his book, I was struck by how closely his views coincided with mine. As I continued to work on gathering material for a book on the Nostratic languages, I realized that I needed help, or I would never get done — the material just kept becoming more and more voluminous. Therefore, I asked Kerns to assist me by writing the chapter on Nostratic morphology and syntax. This he agreed to do. This collaborative effort resulted in the publication (in 1994) of our joint monograph *The Nostratic Macrofamily: A Study in Distant Linguistic Relationship* (Berlin, New York, NY, and Amsterdam: Mouton de Gruyter). It is with great sadness that I must note here that Kerns passed away on 24 November 1995. I enjoyed working with him, and I regret that he was no longer here to help with the current book. No doubt, this book would have benefited tremendously from his keen intellect and vast knowledge.

There are others who offered their help when Kerns and I were preparing our joint monograph — the problems associated with working with so many different language families required consultation with and assistance from others more qualified than I in their respective areas of expertise. Thanks are due especially to Aimo Murtonen for reviewing the Afrasian material, to Karl Krippes for reviewing the Altaic material, and to Gyula Décsy for commenting on Uralic. Others offered overall support and critiques — here, an expression of appreciation is due Mykolas Palmaitis and Hal Fleming. Palmaitis, in particular, advised me not to rush into print before studying the other language families in greater detail. Moreover, the papers and letters he sent me contained many insightful and stimulating ideas along with much-needed criticism and advice. Fleming, on the other hand, helped me to network with others working on problems of distant linguistic relationship. He also was the source of many of my best ideas. Indeed, I will never be able to repay the enormous debt I owe him. And, as if that were not enough, in the process, he has become a friend. I am also grateful to Claude Boisson and Václav Blažek, who generously shared their work with me. Had it not been for Boisson's pioneering

studies, I would not have ventured into Sumerian, while Blažek's many articles on Nostratic have been a constant source of inspiration. Finally, I would like to express gratitude to Werner Winter for recommending that Mouton de Gruyter accept the book for publication in the Trends in Linguistics series.

In early 1994, Ken Jacobs, Department of Anthropology, University of Montreal, invited me to deliver a paper at a session on "Language, Culture, and Biology in Prehistoric Central Eurasia: (Re)establishing the Links" at the 1994 annual meeting of the American Anthropological Association to be held in Atlanta, GA, in December of that year. Jacobs charged participants to move beyond their specialties and interests and to approach the issues from a multidisciplinary perspective. Other participants included well-known linguists and anthropologists. It was at that meeting that I had the good fortune to meet John Colarusso for the first time. The original title that I selected for my paper was "Archeology and the Nostratic Hypothesis".

Then, later in that year, Kevin Tuite, a colleague of Jacobs, invited me to deliver a paper covering the same topics before faculty members and students of the Department of Anthropology, University of Montreal, which I did on 20 October 1994. By then, I had changed the title to "Indo-European and the Nostratic Hypothesis". Reaction to the paper was enthusiastic, and a lively discussion ensued, with many valuable comments being received from Marc Picard, Étienne Tiffou, Kevin Tuite, and others in attendance.

As time went on, I kept adding new material to the paper, which, as a result, grew to over eighty typed pages by the time I reached Atlanta.

When I was in Montreal in October 1994, Tuite suggested to me that it might be valuable to have a book on Nostratic that was aimed at a more general audience than my 1994 joint monograph *The Nostratic Macrofamily*. Tuite wanted a book that he could use in his classes — most of his students are anthropology majors. I liked Tuite's suggestion. The paper that I delivered first in Montreal and then in Atlanta seemed like a good place to start. Not only did it contain a summary of much that was in my 1994 book, it also contained, thanks to Jacobs, a discussion of homelands, which, by its very nature, incorporated a good deal of information derived from archeology and anthropology. Over the next few months, I reworked the paper, dividing it into chapters and adding much new material.

Then, in mid-1994, Joseph Greenberg sent me a draft of the manuscript for the volume on morphology (published in 2000) of his two-volume work *Indo-European and Its Closest Relatives: The Eurasiatic Language Family*. I learned much from it and revised the manuscript of my book accordingly. (Volume 2 of Greenberg's book, Lexicon, appeared in 2002.)

In the course of working on the book, valuable comments were received from Hal Fleming and, especially, the late Igor M. Diakonoff. Next, in December 1995, Alexis Manaster Ramer engaged me in a challenging on-line debate on Nostratic. At the same time, Manaster Ramer brought my attention to his many insightful articles on Nostratic. As a result of this debate and reading Manaster Ramer's articles, additional refinements were made. I would also like to thank Manaster Ramer for pointing out that two entries (the terms for the number 'seven' and 'bull, steer')

included in my earlier work could better be explained as borrowings — those entries have since been removed.

Finally, at the end of 1996, my book *Indo-European and the Nostratic Hypothesis* (Charleston, SC: SIGNUM Desktop Publishing) was published.

In July 1998, Fabrice Cavoto sent me the manuscript of a long work he had prepared entitled *Histoire du fennique et de l'ouralien dans la perspective des recherches nostratiques [History of Fennic and Uralic from the Perspective of Nostratic Research]*. This work is enormously important in clarifying many issues relating to the position of Uralic within Nostratic. To my knowledge, it has never been published.

The present book differs in many ways from previous works on the subject, including my own. The most important new feature is the inclusion of a comprehensive treatment of Nostratic morphology, which was treated rather superficially in my 1994 co-authored book *The Nostratic Macrofamily: A Study in Distant Linguistic Relationship*. This addresses one of the main criticisms often directed at the Nostratic Hypothesis, namely, the relative dearth of morphological evidence presented by its proponents. For the first time, all aspects of the putative proto-language are discussed in detail: phonology, morphology, vocabulary, syntax, and homelands. Lyle Campbell (among others) has repeatedly emphasized the need to include comparative morphology.

Two lengthy chapters are devoted to comparative Nostratic morphology. The first chapter lists the evidence, and the second chapter attempts a tentative reconstruction. To complement the chapters on Proto-Nostratic morphology, two additional chapters are devoted to Proto-Indo-European morphology. The first chapter deals with the traditional reconstruction of Proto-Indo-European morphology, while the second attempts to outline its prehistoric development.

Since the publication of *The Nostratic Macrofamily*, many advances have been made in each of the branches of Nostratic. New etymological dictionaries have appeared for Afrasian, Kartvelian, Altaic, Chukchi-Kamchatkan, and Eskimo-Aleut, as well as numerous comparative and descriptive grammars, articles, books, and dictionaries for the languages making up each branch (the individual languages/ language families). As much as possible, this scholarship has been consulted and incorporated into the present book, and the works consulted have been included in the list of references.

Each Nostratic etymology proposed in *The Nostratic Macrofamily* has been carefully re-evaluated and, in the vast majority of cases, reworked — the supporting material has been augmented, and more copious references are given to the relevant literature. In several instances, the etymologies have been thoroughly rewritten, either to reflect current scholarship or as a result of criticism received from colleagues. Some less convincing etymologies have been removed, while about two hundred new etymologies have been added. As noted above, borrowings have been removed.

As I was finishing work on the manuscript for this book, I had the good fortune to obtain a copy of the draft of Dolgopolsky's *Nostratic Dictionary* (which became available on-line in 2008 at: http://www.dspace.cam.ac.uk/handle/1810/196512)

from the McDonald Institute for Archaeological Research, Cambridge University. I have added references to Dolgopolsky's dictionary where appropriate. I also made changes to several of the etymologies proposed in this book and added a significant number of new etymologies as a result of consulting this dictionary.

For the first time, a sizable amount of material has been included from Eskimo-Aleut and Chukchi-Kamchatkan.

The chapters on phonology have also been revised to take into consideration recent advances in the scholarship of each of the individual branches of Nostratic, while the reconstruction of the Proto-Nostratic phonological system has been refined, though there are still several rather bothersome problem areas. In particular, the reconstruction of the Proto-Nostratic vowels is vastly improved over what was posited in *The Nostratic Macrofamily*. Here, I would like to thank Patrick Ryan for bringing my attention to several potential problem areas with my previous views on Proto-Nostratic vocalism.

I have tried to design each chapter so that it is complete in itself. This means that a certain amount of redundancy has been purposely built into the book. Though this has added to the overall length of the book, it has the important advantage of having all of the relevant information about the topic(s) under discussion in one place. I have also tried to be generous in citing relevant literature. Considering the scope of this book, I cannot say that every work ever written on a particular subject has been consulted; nonetheless, the number of works cited is quite extensive, and enough is given so that interested readers can check my sources for themselves, can obtain additional or more in-depth information, and can also check what others have had to say about a particular matter, especially when there are differences of opinion within the scholarly community or when an alternative or controversial proposal has been made.

In the course of writing this book, I sent draft copies to numerous colleagues, soliciting their criticisms, comments, suggestions, etc. Valuable comments were received from Hal Fleming, Winfred P. Lehmann, Shamil Nafiqoff, Ed Robertson (who reviewed an earlier draft of the chapter on Etruscan), Panu Hakola, Harvey Mayer, Edgar Polomé, Paul Sidwell, George Starostin, among others. I would like to thank them for the time and effort they made to review and comment upon my work. Needless to say, I, alone, am responsible for any errors that may occur in this book. Special thanks are also due Irén Hegedűs and Paul Sidwell for inviting me to participate in the Nostratic Centennial Conference held at the University of Pécs, Hungary, on 21—23 August 2003.

Finally, I would like to express my gratitude to Liesbeth Kanis, Patricia Radder, and the staff at E. J. Brill for accepting the book for publication and for seeing it through the production process.

Allan R. Bomhard
Charleston, SC

PREFACE

A Comprehensive Introduction to Nostratic Comparative Linguistics: With Special Reference to Indo-European.
First edition.

All of my work on Nostratic has been cumulative. Each new iteration incorporates, corrects, and expands upon everything that I have written before. This book is different in but one respect — it represents my final contribution to the subject (though I will continue to make corrections, as warranted).

The current iteration has given me the opportunity to correct a number of typographical and other errors that, unfortunately, appeared in the immediately previous iteration (*Reconstructing Proto-Nostratic*). However, even though I have tried to be extremely thorough, I am sure that there are still errors here and there that have escaped my attention. I will continue to correct any errors that I or others may come across.

Countless changes have been made throughout this new iteration on the basis of more recent scholarship. Moreover, over 100 new Nostratic etymologies have been added, new material has been incorporated into existing etymologies, and the list of references has been expanded. All of the Germanic, Italic, Albanian, Kartvelian, Elamite, North and Central Cushitic, Hebrew, and Geez material cited in Part Three, Comparative Vocabulary (Volumes 2 and 3), has been reviewed, corrected, and expanded. Hebrew and Geez forms are now cited in both their native scripts and in transliteration. Altogether, over 400 pages have been added to the current iteration. Every chapter has been modified — several quite extensively. Due to the increase in size, I have divided this new iteration into four volumes, and I have changed the title to *A Comprehensive Introduction to Nostratic Comparative Linguistics*.

I would like to thank Arnaud Fournet, Stefan Georg, and Simonetta Pelusi for their insightful reviews of *Reconstructing Proto-Nostratic*. I would also like to thank Pierre Bancel and David Appleyard for their comments and suggestions. Finally, I want to express my gratitude to Carla Breidenbach.

I owe an enormous debt to Arnaud Fournet. He proofread a draft of the entire manuscript of volume 1 of the current iteration and saved me from making many foolish mistakes. It goes without saying that I alone am responsible for any mistakes that remain.

In closing, it is gratifying to note that, as far back as 1933 (English translation 2011), Holger Pedersen had already hinted at many of the same conclusions reached in this book.

Allan R. Bomhard
Charleston, SC
February 2014

PREFACE

A Comprehensive Introduction to Nostratic Comparative Linguistics: With Special Reference to Indo-European.
Second revised, corrected, and expanded edition.

This edition contains many corrections and updates. New material and references have been added to take into consideration the latest scholarship, and new sections have been added to several chapters as well. Chapter 7, A Sketch of Proto-Afrasian Phonology, has been reformatted and greatly expanded. I have added one new etymology, and I have added a great deal of additional material, especially from Berber and Yukaghir, to the existing etymologies. Finally, I have added many new items to the list of references, including recent theoretical works. References to and quotations from these works have been included where appropriate. All told, just over 300 pages have been added.

In this edition, I have paid special attention to addressing all of the doubts and criticisms that have been expressed to date against both the glottalic model of Proto-Indo-European consonantism and the Nostratic Hypothesis. Some of the misgivings were actually quite easy to refute, while others required careful reconsideration and a more nuanced refutation. In those cases where the criticisms were legitimate, the mandatory changes have been made.

Special thanks are due to Petr Hrubiš for bringing the work of Andrew Simpson to my attention.

Allan R. Bomhard
Charleston, SC
October 2015

PREFACE

A Comprehensive Introduction to Nostratic Comparative Linguistics: With Special Reference to Indo-European.
Third revised, corrected, and expanded edition.

For the third edition of this book, I have added several new Nostratic etymologies in addition to new references to existing etymologies (volumes 2 and 3) — there are now 975 potential Nostratic etymologies. I have also modified many of the existing etymologies. I have added two chapters to volume 1: (1) Chapter 18: Nostratic Morphology III: Derivational Morphology and (2) Chapter 21: Language Contact: Indo-European and Northwest Caucasian. Every chapter of volume 1 has been modified to some extent to reflect the latest scholarship, while several of the chapters have been considerably expanded. Finally, a large number of new books and articles have been added to the list of references (volume 4).

Keeping in mind Ockham's razor, I have tried to keep my proposals as simple and straightforward as possible, carefully avoiding speculations not supported by the evidence. I have totally eschewed the use of Swadesh lists, lexicostatistics, and glottochronology.[1] The shortcomings of these methodologies have been discussed over and over again in the relevant literature (for the most recent criticism of these methodologies, cf. Roger Blench's 2014 paper "Language Levelling Challenges All Mathematical Methods of Language Classification"). Continued use of discredited methodologies such as Swadesh lists, lexicostatistics, and glottochronology by some scholars, mostly in Russia, does not inspire confidence in the conclusions reached. That is not to say that these methodologies are totally worthless. I put them in the same category as the Greenberg's "mass comparison" / "multilateral comparison" — useful to a certain extent in the preliminary stage of testing hypotheses regarding possible genetic relationship among the languages being examined, but in no way a substitute for the Comparative Method and Internal Reconstruction. They are only as good as the assumptions upon which they are based — astonishingly, those assumptions keep changing as scholars struggle to refine these methodologies in response to criticisms and to correct inherent flaws. Sadly, the flaws are both too numerous and too deep-rooted to be overcome, some heroic efforts in that direction notwithstanding (cf. G. Starostin 2010) — as noted by Roy Andrew Miller (1980: 86):

> For the historical linguist, the entire proposition of "basic vocabulary," including both the idea that some words in a language are, or should be, more resistant to historical change than others, and the idea that certain kinds of words are of special importance in helping to demonstrate a genetic relationship of languages in a convincing fashion, is unsupported, undemonstrable, and unscientific…

[1] A recent issue of *Diachronica* was devoted to a discussion of these methodologies: Søren Wichmann and Anthony Grant (eds.), *Quantitative Approaches to Linguistic Diversity: Commemorating the Centenary of the Birth of Morris Swadesh*. (= *Diachronica* XXVII/2, 2010.) Amsterdam and Philadelphia, PA: John Benjamins.

> The damage that has been done to historical linguistics because of the mistaken application of the essentially erroneous thesis of "basic vocabulary," particularly when some scholars have attempted to employ it for quasi-statistical purposes ("glottochronology" or "lexico-statistics"), has been immense.

One particularly powerful way to judge the validity of a genetic hypothesis is the predictive ability of that hypothesis. That is to say that, once correspondences have been established, can and do they lead to additional discoveries both about the languages being compared as well as about the proto-language from which they are alleged to have descended? Time and again, this is exactly what has happened with the version of the Nostratic Hypothesis presented in this book and in my previous works. Each iteration not only builds upon my previous findings, it also includes new discoveries that complement, enhance, and confirm those findings. A sufficient body of evidence has now been collected and systematically analyzed in accordance with established methodologies to dispel any lingering doubts about the overall validity of the Nostratic Hypothesis and to lay a concrete foundation for future research.

To reiterate and emphasize, we can and should judge the validity of a theory on the basis of its overall simplicity, its ability to make predictions, and its usefulness.

There was a time — not too long ago — when scholarly books and articles were often quite difficult to obtain. Such books were typically printed in small quantities and, in due course, became out of print, while important articles were more often than not published in highly specialized journals. Gaining access to these publications was particularly challenging, especially for those working on multiple languages and/or language families. With the advent of the Internet, this situation has changed dramatically. Now, there is so much literature available that it is overwhelming. Moreover, copyright protection seems to have little meaning in the digital age. New books are frequently available on one web site or another for free download almost as soon as they are published.

Allan R. Bomhard
Florence, SC
January 2018

PART ONE

INTRODUCTION, COMPARATIVE PHONOLOGY, HOMELANDS, ETC.

CHAPTER ONE

INTRODUCTION, HISTORY OF RESEARCH, AND METHODOLOGY

1.1. INTRODUCTION

Distant (or long-range) linguistic comparison seeks to investigate the possibility that certain languages or language families, not previously thought to be genetically related, at least not "closely" related, might indeed be part of still larger groupings, which may be called "macrofamilies".

This book will focus on Indo-European. The purpose is to show that Indo-European is not genetically isolated but, rather, that it is distantly related to certain other language families of northern and central Eurasia, the Indian subcontinent, and the ancient Near East. Where appropriate, issues concerning the other language families with which Indo-European is most likely related will also be discussed.

1.2. HISTORY OF RESEARCH

From the very earliest days of Indo-European comparative linguistics, there have been speculations about the possible genetic relationship of Indo-European to other language families. Though, in the course of study, many striking similarities were noted between Indo-European and certain other language phyla, notably Uralic and Afrasian (formerly called Hamito-Semitic, Semito-Hamitic, Afroasiatic, Erythraic, and Lisramic), truly convincing evidence of distant linguistic relationship was simply not brought forth. Indeed, much of the early work was not of high quality and did more to discredit the attempt to discover possible relatives of Indo-European than to help. Gradually, the intellectual climate, especially in the United States of America and France, became hostile to long-range comparison, and Indo-European remained an orphan with no known relatives.

In the first half of the nineteenth century, no less a figure than one of the founders of Indo-European comparative grammar, Franz Bopp, investigated possible relationship of Indo-European with Kartvelian (in 1846 and 1847) on the one hand and with Malayo-Polynesian (in 1840) on the other. In the mid-1860's, Rudolf von Raumer (in 1863) and Graziadio Ascoli (in 1864) claimed that Indo-European and Semitic were related. At about the same time (in 1869), Vilhelm Thomsen proposed relationship between Indo-European and Finno-Ugrian. This proposal was later (in 1879) explored in depth by the Estonian Nicolai Anderson and (in 1900) by the British phonetician Henry Sweet. Unfortunately, Anderson's

work contained too many errors to be of lasting value. However, insightful and solid contributions were made concerning the possible relationship of Indo-European and Uralic during the twentieth century by the Swedish Uralicist Björn Collinder. Towards the end of the nineteenth century (1873), the Semiticist Friedrich Delitzsch investigated lexical parallels between Indo-European and Semitic. Then, at the beginning of the twentieth century, the Danish linguist Hermann Möller, in the course of several publications, attempted to show that Indo-European and Semitic might be related. Möller's work was later continued by the French linguist Albert Cuny, whose last publications date from the mid-1940's. Möller's and Cuny's efforts were generally not highly regarded by the scholarly community. One exception was Möller's student Holger Pedersen, who not only coined the term "Nostratic" but who also expanded the definition to include Indo-European, Semitic, Samoyed and Finno-Ugrian, Turkish, Mongolian, Manchu, Yukaghir, and Eskimo. Though Pedersen never published a systematic account of his views, he did make the following insightful observations (1931:335—338):

> The question of the relationship among the Indo-European and foreign families of languages came up in the first period of comparative linguistics. Relationship between Semitic and Indo-European was asserted by Rudolf von Raumer, beginning in 1863, and by Ascoli from 1864 on. But convincing proof could not be expected at that time. Resemblances in the morphology of the two families are extremely few, and proof by means of vocabulary and the laws of sounds was not then understood. Schleicher denied most positively any relationship between the two, pointing to the great dissimilarity in the forms of the roots: in Semitic the roots consist of three syllables of very simple and uniform structure, as in Arabic *ḳatala* (root form and preterite of the verb 'to kill'), while in Indo-European the roots are monosyllabic and of widely varying — partly heavily compounded — form, as in Latin *ī-re* 'to go,' *stā-re* 'to stand,' *lub-et* 'it pleases,' *vert-ō* 'I turn,' *ed-ō* 'I eat,' and so on. At that time nobody could weaken this argument. And it might have been added, although Schleicher did not do so, that the phonetic systems of the two language families are extremely different, as may be seen from a single example: in Semitic there is an abundance of gutturals, whereas in Indo-European there is not one, not even the (to us) ordinary *h*. With this in view, one might feel tempted to assent to Schleicher's exclamation: "What weight have the few similarities in roots in the two language families against these sharp contrasts?" And one might well be disposed to neglect "the few similarities" which one could not help observing.
>
> Nothing was changed in the problem by the first step in a systematic examination of the vocabulary which Friedrich Delitzsch took in his *Studien über indogermanisch-semitische Wurzelverwandtschaft* (1873). But the development of Indo-European linguistics changed the problem greatly. The monosyllabic form of Indo-European roots turned out to be an entirely secondary phenomenon: in historical times the roots of the words for *heaven*, *god*, or *heart* may appear to be **diw*- or **ḱerd*-, but we have good reason to believe that in the period older than that of the Indo-European parent language

these roots had forms like **däyäwä-*, or **ǩärädä-* …, and that the phonological system in this older period had quite a different appearance from that which we attribute to the Indo-European language.

With this background, there appeared in 1906 an extraordinarily important work by the Danish scholar Hermann Möller, *Semitisch und Indogermanisch*. This is a splendid attempt to discover the laws controlling the relationship between Indo-European and Semitic consonants — a successful attempt, although only the main lines of development are traced. Time alone will show how far we can advance by Möller's method. Certain it is, however, that the comparison of the two families can never be carried out so completely and in such detail as the comparison within the fields of the individual languages of one family.

But Indo-European has been brought into connection with other families besides Semitic. Vilhelm Thomsen, as early as 1869, indicated the possibility of a relationship with Finno-Ugrian, but he did not pursue the subject very far. In 1879, the Estonian Nicolai Anderson published an extensive work on the subject, the value of which is considerably impaired by its many errors. Great interest was awakened when the English scholar Henry Sweet advocated the relationship somewhat passionately in a little popular book, *The History of Language* (1900). However, among the individual similarities which Sweet mentions, some are incorrect, and his space was too limited to permit of actual proof. Trustworthy studies of some length by K. B. Wiklund and H. Paasonen appeared in 1906 and 1908. After these works it seemed unnecessary to doubt the relationship further.

Moreover, the inflectional systems show much greater relationships than in the case of Semitic. The original ending of the accusative case in Finno-Ugrian was *-m*, which in Finnish has changed to *-n*. The same ending is Indo-European:

Finnish	*Cheremissian*	*Latin*	*Greek*
Nominative *käsi* hand	*kit*	*vespera* evening	*hespérā*
Accusative *käde-n*	*kið-əm*	*vespera-m*	*hespérā-n*

The similarities in the personal endings of verbs are especially striking:

Finnish	*Cheremissian*	*Greek*	*Sanskrit*
1st person sg. *kuolen* I die	*kole-m*	*é-phero-n* I carried	*a-bhara-m*
1st person pl. *kuole-mme* we die		*e-phéromen* we carried	
2nd person pl. *kuole-tte* you die		*e-phére-te* you carried	

Furthermore, there is an unmistakable similarity between the two families in a series of pronouns and in the negation 'not':

Finnish	*Latin*
minä I (Lappish *mon*)	*mē* me
sinä thou (*s* from *t*; Lapp. *don*)	*tē* thee

	Sanskrit
tä-mä this	*ta-*
jo-ka who, which (relative)	*ya-*
ku-ka who? (interrogative)	*ka-*

Hungarian	*Old Norse*
ne not	*ne* not

It is impossible to regard all this as the result of accident. It is noteworthy, however, that the similarities hitherto pointed out in the more concrete part of the vocabulary are very few, although some of them are as striking as Finnish *nimi* 'name,' and Latin *nōmen*. Consideration of the problem whether sound-laws still unknown to us, or morphological developments not yet understood, have obliterated the originally more numerous points of similarity, or whether the vocabulary in one of the families was largely renewed after the period in common, we must postpone until later. But to deny relationship between the families would be overbold.

If we accept relationship, we are led yet further afield, not only to Samoyed, which cannot be separated from Finno-Ugrian, but throughout all of Northern Asia and across the Bering Strait, because similar, though fainter, resemblances like those here cited are found also in Turkish, Mongolian and Manchu, in Yukaghir, and even in Eskimo. If, on the other hand, we agree in the matter of relationship with Semitic, then we must also accept relationship with the far-flung Hamitic family, and perhaps with Basque. And squarely in the midst between our supposed Northern and Southern relatives stand the Caucasian languages, which we cannot ignore, and various extinct languages in Asia Minor and thereabout. It is not impossible that some of the non-Indo-European languages of antiquity in Asia Minor were once most closely related of all to the Indo-European family.

As a comprehensive designation for the families of languages which are related to Indo-European, we may employ the expression *Nostratian Languages* (from Latin *nostrās* 'our countryman'). The boundaries for the Nostratian world of languages cannot yet be determined, but the area is enormous, and includes such widely divergent races that one becomes almost dizzy at the thought.

In 1969, Linus Brunner published a detailed comparison of the Indo-European and Semitic vocabularies, and this was followed in 1980 by a wider comparison of languages undertaken by Kalevi E. Koskinen. We should note also that, though the investigation of problems relating to distant linguistic comparison was generally ignored by the vast majority of mainstream linguists, the field was never completely dormant — a small but persistent group of scholars (Pentti Aalto, John Bengtson, Knut Bergsland, Václav Blažek, René Bonnerjea, Karl Bouda, Bojan Čop, Heinz Fähnrich, Joseph Greenberg, Panu Hakola, Carleton T. Hodge, Georgij A. Klimov, D. H. Koppelmann, Frederik Kortlandt, Saul Levin, Karl H. Menges, Roy Andrew Miller, Shamil Nafiqoff, Mikolas Palmaitis, Stephen A. Tyler, Ants-Michael Uesson, C. C. Uhlenbeck, to name but a few of the many scholars working on long-

range comparison) has continued to work, throughout the better part of the twentieth century and on into the twenty-first century, on binary (or, in rare cases, wider) comparisons of various languages that are currently considered to belong to the Nostratic macrofamily. For comprehensive bibliographies listing publications dealing with distant linguistic comparison, cf. Hegedűs 1992a, Landsberg 1986, Bomhard—Kerns 1994:715—864, and the list of references contained in this book.

Beginning in the mid-1960's, the intellectual climate slowly began to turn around, and a growing number of linguists, especially in the former Soviet Union, have begun to turn attention toward investigating distant linguistic relationship. The revived interest was sparked by the work of Vladislav M. Illič-Svityč [Иллич-Свитыч] (1934—1966) and Aharon B. Dolgopolsky [Долгопольский] (1930—2012), who first started working independently and, at a later date, through the efforts of their mutual friend Vladimir Dybo [Дыбо], cooperatively. Their work, though not without its own shortcomings, was the first successful demonstration that certain language phyla of northern and central Eurasia, the Indian subcontinent, and the ancient Near East might be genetically related. Following a proposal first made in 1903 by Holger Pedersen, they employed the name "Nostratic" to designate this grouping of languages. In particular, Illič-Svityč, in the course of several publications, culminating in his posthumous comparative Nostratic dictionary (1971—1984), which, unfortunately, was never completed, included Afrasian ("Semito-Hamitic" [Семитохамитский]), Kartvelian, Indo-European, Uralic, Dravidian, and Altaic in his version of the Nostratic macrofamily. From his earliest writings, Dolgopolsky also included Chukchi-Kamchatkan and Eskimo-Aleut.

Before his tragic death in an automobile accident on 21 August 1966, Illič-Svityč had planned to prepare a comparative Nostratic dictionary listing over 600 Nostratic roots and tracing their development in detail in each of the daughter languages in which they were attested. He had published a preliminary report on his work in 1965 entitled (in English translation) "Materials for a Comparative Dictionary of the Nostratic Languages (Indo-European, Altaic, Uralic, Dravidian, Kartvelian, Hamito-Semitic)". Working diligently, literally devoting all of his energy to the project, he had managed to prepare the entries for approximately 350 roots. After his death, Illič-Svityč's work was prepared for publication by the dedicated efforts of Rimma Bulatova, Vladimir Dybo, and Aharon Dolgopolsky, with the result that the first volume of the dictionary appeared in 1971, containing 245 entries. A second, smaller volume appeared in 1976, listing entries 246 through 353 and ending with an index — this completed all of the material prepared by Illič-Svityč himself (by the time this volume appeared, Dolgopolsky was in the process of emigrating to Israel). Finally, the first fascicle of volume three appeared in 1984, containing entries 354 through 378, none of which was prepared by Illič-Svityč — it represents the collective efforts of a team of scholars.

In the meantime, Dolgopolsky continued to make important contributions to Nostratic studies, especially a ground-breaking 1984 paper on Nostratic pronouns, and he worked virtually nonstop on his unpublished *Nostratic Dictionary* until his death in 2012. Fortunately, a draft of this dictionary was made available on-line in

2008. Other Russian scholars have also done important research into problems affecting Nostratic — mention should be made of the work of Alexandra Y. Aikhenvald, N. D. Andrejev, M. S. Andronov, Vladimir Dybo, Eugene Helimskij, Vjačeslav V. Ivanov, G. Kornilov, Oleg Mudrak, Vitaly V. Shevoroshkin, Sergej A. Starostin, V. A. Terent'jev, Vladimir N. Toporov, and V. L. Tsymburskij, among others. Though not Russian (but clearly someone who belongs to the "Moscow School"), special recognition must be given to the Czech scholar Václav Blažek, who has published many important papers, most of which deal with the common Nostratic lexicon. Others who should be noted include Alexis Manaster Ramer and Irén Hegedűs — each has published a number of interesting papers on Nostratic.

Beginning with an article that appeared in *Orbis* in 1975, I published several studies, culminating in a 1984 book entitled *Toward Proto-Nostratic: A New Approach to the Comparison of Proto-Indo-European and Proto-Afroasiatic*, in which I tried to show that Indo-European and Semitic (later expanded to include all of Afrasian) might be distantly related. Reviews of that book as well as discussions with colleagues prompted me to expand the scope of my research to include other language families. This resulted in the publication in 1994 of a joint monograph by myself and John C. Kerns entitled *The Nostratic Macrofamily: A Study in Distant Linguistic Relationship*. It was Kerns who prepared the chapter dealing with Nostratic morphology. That book supplied a great deal of lexical evidence from the Nostratic daughter languages to support the reconstruction of 601 Proto-Nostratic roots. In an article published in *Orbis* in 1995, I supplied material to support an additional 29 Proto-Nostratic roots, and another 21 etymologies were proposed in my 1996 book entitled *Indo-European and the Nostratic Hypothesis*. Afterwards, I continued collecting lexical data, with the result that an additional two hundred Nostratic etymologies were included in *Reconstructing Proto-Nostratic*, which was published in two volumes in 2008. It should be noted that my views on Nostratic differ somewhat from those of Illič-Svityč and Dolgopolsky (see §1.5 below).

The late Joseph Greenberg has prepared a two-volume work entitled *Indo-European and its Closest Relatives: The Eurasiatic Language Family*. The first volume, which was published at the beginning of 2000, deals with grammar, and the second, which was published at the beginning of 2002, deals with lexicon. Greenberg includes Indo-European, Uralic-Yukaghir, Altaic (Mongolian, Chuvash-Turkic, and Manchu-Tungus), Japanese-Korean (Korean, Ainu, and Japanese-Ryukyuan [Japonic]), Gilyak (Nivkh), Chukchi-Kamchatkan, and Eskimo-Aleut in his Eurasiatic language family. Unlike Illič-Svityč, Dolgopolsky, and myself, he does not include Kartvelian, Afrasian, or Elamo-Dravidian — not because he believes that they are unrelated, but because he believes that these three language phyla are more distantly related to Indo-European than are the others, which, along with Indo-European, form a natural taxonomic subgrouping. My own opinion is close to that of Greenberg. As I see the situation, Nostratic includes Afrasian, Kartvelian, and Elamo-Dravidian as well as Eurasiatic; in other words, I view Nostratic as a higher-level taxonomic entity. Afrasian stands apart as an extremely ancient, independent branch — it was the first branch of Nostratic to separate from

the rest of the Nostratic speech community. Younger are Kartvelian and Elamo-Dravidian. It is clear from an analysis of their vocabulary, pronominal stems, and morphological systems that Indo-European, Uralic-Yukaghir, Altaic, Gilyak (Nivkh), Chukchi-Kamchatkan, and Eskimo-Aleut are more closely related as a group than any one of them is to Afrasian, Kartvelian, and Elamo-Dravidian, and this is the reason that I follow Greenberg in setting up a distinct Eurasiatic subgroup within Nostratic. Finally, mention should be made of Sumerian, which I had investigated in previous works as a possible Nostratic daughter language. I now believe that Sumerian was not a Nostratic daughter language but that it is distantly related to Nostratic. It must be noted here that I have also changed my mind about the subgrouping of Kartvelian and Elamo-Dravidian. My present thinking is that Kartvelian is closer to Eurasiatic than what I indicated in my 1994 co-authored book and that the differences are due to the fact that Kartvelian became separated from Eurasiatic at a very early date. On the other hand, I now see Elamo-Dravidian as the second group (after Afrasian) to split from the rest of the Nostratic speech community. An attempt at subgrouping is shown in Chart 1 at the end of this chapter.

Interest in issues dealing with Nostratic has resulted in several conferences, the first of which was held in Moscow in 1972 to coincide with the publication of the first volume of Illič-Svityč's comparative Nostratic dictionary. This was followed by a series of gatherings in Russia. Another major conference was held in Ann Arbor, Michigan, at the end of 1988. Organized by Vitaly Shevoroshkin and Benjamin Stolz, this symposium brought together scholars from East and West. A series of volumes under the editorship of Shevoroshkin has appeared as a result of this conference (published by Brockmeyer in Bochum, Germany). Shevoroshkin has also organized several smaller-scale, follow-up conferences. At the end of 1993, a workshop with the theme "The Second Workshop on Comparative Linguistics. The Status of Nostratic: Evidence and Evaluation" was organized at Eastern Michigan University, Ypsilanti, Michigan. Papers from this workshop were subsequently published in a volume co-edited by Brian Joseph and Joe Salmons (1998). Several important papers on Nostratic also appear in the festschrift for Vitalij Shevoroshkin (1997). In December 1997, a workshop on distant linguistic relationship was held at the Santa Fe Institute in Santa Fe, New Mexico — participants included scholars from around the world.

In early 1998, Dolgopolsky's book entitled *The Nostratic Hypothesis and Linguistic Paleontology* was published. In this book, Dolgopolsky is mainly concerned with linguistic paleontology, and the focus of his attention, therefore, is on putative etyma pertaining to habitat, social organization, and material culture. Dolgopolsky's conclusions are supported by a sample of 125 proposed cognate sets. The book ends with a reconstruction of the Proto-Nostratic phonological system and the reflexes of the consonants (but not the vowels) in the major branches of Nostratic. This book was the focus of a two-day symposium held in July 1998 under the auspices of the McDonald Institute for Archaeological Research, Cambridge University, England. The symposium proceedings were published in mid-1999 in a volume co-edited by Colin Renfrew and Daniel Nettle.

A major conference on "Problems in the Study of Long-Range Linguistic Comparison at the Turn of the Third Millennium" was held at the Russian State University for the Humanities in Moscow from 29 May through 2 June 2000. The conference was organized by Sergej Starostin and covered a number of topics. The first day involved papers on Indo-European. The second day was devoted to Nostratic and included papers on lexical, morphological, and phonological comparisons, as well as more theoretical considerations. There was a session on Altaic, and Starostin gave an introduction to the Altaic etymological dictionary he was then preparing in collaboration with Anna Dybo and Oleg Mudrak (this dictionary has since been published [in 2003]). Another new etymological dictionary presented at the conference was the Semitic dictionary being prepared by Alexander Militarëv and Leonid E. Kogan. Afrasian linguistics was also discussed in several papers at a session on comparative linguistics and ancient Near Eastern history held in memory of the late Igor M. Diakonoff. There was also a session on Sino-Tibetan and Caucasian linguistics.

In August 2003, a Nostratic Centennial Conference, marking one hundred years since the appearance of Pedersen's bold hypothesis, was held at the University of Pécs, Hungary. The conference proceedings were published in 2004 in a volume co-edited by Irén Hegedűs and Paul Sidwell.

The Institute of Slavistics and the Department of History and Philology of the Russian Academy of Sciences sponsored a conference in Moscow honoring the 70th birthday of V. M. Illič-Svityč on 20—22 October 2004. The conference covered problems of the comparative-historical grammar of both Indo-European and Nostratic languages, of the remote relationship of languages, and of the history of Slavic and Baltic languages and their dialects.

Additional conferences and symposia have since occurred.

1.3. METHODOLOGY

Even though I have repeated the following points verbatim many times in previous works, I still read irresponsible statements being made in the literature to the effect that Nostraticists do not use "traditional methods" or that they use a "weakened form" of the Comparative Method. Nothing could be farther from the truth. Therefore, I will once again state the methodological principles used in distant linguistic comparison (cf. Bomhard—Kerns 1994:7—11; Bomhard 1996a:4—9 and 2008e.I:8—13).

The founders of Indo-European comparative linguistics placed great importance on the comparison of grammatical forms, and this bias continues to the present day in Indo-European studies and has even been carried over into the study of other language families. However, this overemphasis on the comparison of grammatical forms is far too restrictive and was the reason that the Celtic languages, which have developed many unique features, were not immediately recognized as Indo-European. As noted over eighty years ago by Pedersen (1931: 245) (these same points were made in 2008 by Anna Dybo and George Starostin):

> That agreement in the inflectional system is an especially clear and striking proof of kinship, no one denies. But it is only an anachronism in theory, which has no significance in actual practice, when such an agreement is still designated as the only valid proof. No one doubted, after the first communication about Tocharian..., that the language was Indo-European, though at that time virtually no similarities in inflection had been pointed out. Such similarities have since been shown, but even where they are almost obliterated, proof of kinship could be adduced from the vocabulary and from sound-laws. Hardly any one will assert that it would be impossible to recognize the relationship between, say, English and Italian, even without the help of other related languages or older forms of these two languages themselves, although agreements between the inflectional systems are practically nonexistent.
>
> From the modern point of view it must be said that proof of relationship between languages is adduced by a systematic comparison of languages in their entirety, vocabulary as well as grammar. The reason why earlier scholars felt they should disregard the vocabulary was that they knew of no method of systematic comparison in the field.

The approach to language comparison that I have followed in attempting to establish genetic relationship among the various Nostratic languages is derived, in part, from that advocated by Joseph H. Greenberg in the chapter entitled "Genetic Relationship among Languages" in his 1957 book *Essays in Linguistics* and, in part, from traditional methods of comparison and internal reconstruction. In my opinion, the combination of Greenberg's methodology and more traditional methods of comparison can inform and further one another. The principles established by Greenberg are as follows: Greenberg notes that the only way to establish hypotheses about genetic relationship is by comparing languages. However, the problem is in knowing which languages to compare and in knowing what to compare since not all aspects of language are equally relevant to comparison. To be meaningful, comparison must strive to eliminate chance resemblances and to separate borrowings from native elements. This is often easier said than done; however, Greenberg lays out two main techniques for detecting borrowed lexical items. First, he notes that borrowing is most commonly confined to certain semantic spheres (for example, cultural items) and certain grammatical categories (nouns far more often than verbs). Second, borrowed words can be distinguished from native vocabulary by expanding the range of comparison to include additional languages. It may be noted that Militarëv (2009:97) has prepared an excellent set of rules for detecting borrowings (see also Haspelmath 2009a).

The simplest way to establish genetic relationship is by identifying a large number of similar morphs (or allomorphs), especially irregularities, in similar environments in the languages being considered. Another significant indicator of probable genetic relationship is the presence of similar rules of combinability. Unfortunately, historical processes over the passage of time tend to bring about the gradual transformation and eventual elimination of such similarities. The longer the

period of separation, the lesser the chances will be that similarities of morphological forms and rules of combinability will be found.

Fortunately, there remain other factors that can be helpful in determining possible genetic relationship. One significant factor is the semantic resemblance of lexical forms. Here, it is important to be able to establish recurrent sound-meaning correspondences for a reasonably large sample of lexical material. Lexical forms with identical or similar meanings have the greatest value. Next in value come forms that, though divergent in meaning, can convincingly be derived, through widely-attested semantic shifts, from earlier forms of identical or similar meaning. The chances that lexical resemblances indicate genetic relationship increase dramatically when additional languages are brought into the comparison and when these new languages also exhibit a very large number of recurrent sound-meaning correspondences. Greenberg originally called this method "mass comparison" (subsequently, he changed this to "multilateral comparison"). He considers the comparison of basic vocabulary from a large number of languages from a specific, wide geographic area to be the quickest and most certain method to determine possible genetic relationship. To Greenberg, lexical data are of paramount importance in attempting to establish genetic relationship among languages, especially in the initial stages of comparison.

The basic principles underlying the Comparative Method may be summarized as follows: The first step involves the arduous task of data gathering, placing special attention on gathering the oldest data available. Once a large amount of lexical material has been gathered, it must be carefully analyzed to try to separate what is ancient from what is an innovation and from what is a borrowing. After the native lexical elements have been reasonably identified in each phylum, the material can be compared across phyla to determine potential cognates. Once a sufficient body of potential cognates has been identified, one can begin to work out the sound correspondences. Not only must the regular sound correspondences (that is, those that occur consistently and systematically) be defined, exceptions must also be explained. Here, widely-attested sound changes (palatalization, metathesis, syncope, assimilation, dissimilation, etc.) provide the key to understanding the origin of most exceptions. In other cases, the analysis of the influence that morphology has exerted provides an understanding of how particular exceptions came into being. Some exceptions, though clearly related, simply defy explanation. All of these must be noted. The final step involves the reconstruction of ancestral forms and the formulation of the sound laws leading to the forms in the descendant languages, identifying the laws that have produced the regular sound correspondences as well as the exceptions. The same principles apply to the reconstruction of grammatical forms and rules of combinability and to the identification of the historical transformations leading to the systems found in the daughter languages. Invariably, it takes the dedicated efforts of several generations of scholars to work out all of the details. Here, we may cite the case of Indo-European — as even the most casual reading of Lehmann's 1993 book *Theoretical Bases of Indo-European Linguistics* shows, after two full centuries of research into

what must surely be the most thoroughly-studied language family on the face of the earth, there still remain many uncertainties about the reconstruction of the Indo-European parent language. The following are superb introductions to Comparative-Historical Linguistics: Arlotto 1972; Bynon 1977; L. Campbell 2013; Hock—Joseph 1996; Lehmann 1973 [1992]; Sihler 2000. More advanced are: Anttila 1972 and 1989; Hock 1986 [1991a]; Ringe—Eska 2013. See also Bowern—Evans (eds.) 2014; Campbell—Mixco 2007; Hoenigswald 1960; Trask 1994, 1996, and 2010.

At this point, we may note that the description of the Comparative Method and Internal Reconstruction given by Schwink (1994:9) is virtually identical to the procedure outlined in the preceding paragraph:

> Let us now proceed to the nuts and bolts of reconstruction. Winter (1970:149) describes the comparative method in the following terms. First one carries out "inspection". This is looking at a number of languages for "a sufficient number of apparently recurrent correspondences". One should look at the oldest stages of languages, judge which languages have the most archaic features or residues (Lehmann 1990). Inspection is followed by "sorting" which involves a complete listing of the correspondences discovered although without interpretation (Winter 1970:149). Thereafter comes the reduction of the material to major correspondence classes. If there are irregularities in distribution, one looks for specific factors which may condition the difference. This is now an interpretive procedure. The label chosen for an entity of a major correspondence class should have "a maximum of similarity with the items labeled" (p. 152). In this selection, the question of archaicity of daughter languages will be taken into account. After assumption that the label represents some earlier stage of the languages being looked at, an attempt may be made to look at the labels of parts of systems.
>
> The comparative method does not produce temporal distinctions... It produces a proto-language which is a potpourri of features. It will be the job of internal analysis to sort out this proto-language.

As noted in the first paragraph of this section, it was necessary to discuss these issues in order to address concerns that have been raised about the applicability of traditional methods of comparison to long-range comparison. It must be made perfectly clear that the same principles are just as applicable to long-range comparison as they are to any other type of linguistic comparison. The fact is, these are the only tools we have. Moreover, they work — their efficacy has been proven over and over again.

Furthermore, claims that these methodologies break down when one tries to apply them beyond a certain time limit, say 5,000 to 10,000 years ago, can be shown, without a shadow of doubt, to be false. One can cite, for example, the case of the aboriginal languages of Australia. Archaeological evidence indicates that Australia has been inhabited by human beings for at least 40,000 years, and possibly even longer. Though there remain many unsettled questions, such as exactly when a putative Proto-Australian might have been spoken (probably at least 30,000 years ago), or about how the different languages should be subgrouped, and

so on, it has been suggested (though not proven) that all extant languages belong to the same family (cf. Ruhlen 1987:188), and comparative work on these languages is continuing apace (cf. McConvell—Bowern 2011; Paul Black 2017). Another example is the Afrasian language family. Due to the extremely deep divisions among the six branches of Afrasian (Semitic, Egyptian, Berber, Omotic, Cushitic, and Chadic), which are far greater than those found, by way of comparison, among the earliest attested branches of Indo-European, the Afrasian parent language must be placed as far back as 10,000 BCE (cf. Diakonoff 1988:33, fn. 15), or perhaps even earlier, according to some scholars (Hodge [1993:99], for example, dates Proto-Afrasian [his Lisramic] at 13,000 BCE). This extremely ancient date notwithstanding, the major sound correspondences have been determined with great accuracy (cf. Diakonoff 1992), excellent progress is being made in reconstructing the common lexicon (to date, three main Afrasian etymological dictionaries have appeared: one by Vladimir E. Orël and Olga V. Stolbova [1995], one by a team of Russian scholars, and one by Christopher Ehret [1995]), and scholars are beginning to piece together the original morphological patterning, though progress here lags behind other areas. Comprehensive surveys of the Afrasian languages are: David Cohen (ed.), (in English translation) *Languages in the Ancient and Modern World: Hamito-Semitic Languages* (1988), and Zygmunt Frajzyngier and Erin Shay (eds.), *The Afroasiatic Languages* (2012). A good introduction — though now somewhat out of date — to Afrasian comparative phonology and morphology is *Afrasian Languages* (1988) by Igor M. Diakonoff. Finally, it should be noted that Edward Lipiński brings in a lot of data from related Afrasian languages in his *Semitic Languages: Outline of a Comparative Grammar* (1997; second edition 2001), as does Stefan Weninger (ed.), *The Semitic Languages* (2011).

One last point needs to be made: Reconstructed languages should be thought of as real languages in every sense of the term. Of course, our reconstructions are, in a sense, purely formulaic, and one can only hope to approximate, not fully recover, all of the features of the actual proto-language. Nevertheless, our reconstructions can be surprisingly accurate, as can be seen, for instance, when reconstructed Proto-Romance is contrasted with so-called “Vulgar Latin”. When we undertake the task of trying to recover the salient features of this or that proto-language, we must be very careful not to reconstruct anything that is not characteristic of language in general: our goal should be to strive for reality in our reconstructions (cf. Labov 1994:17). The prudent use of the insights gained from linguistic typology can be extremely valuable in helping to arrive at realistic reconstructions. Now, a few more conservative linguists have questioned the propriety of using typological data in Historical-Comparative Linguistics, their main argument running somewhat along the lines: “since we cannot possibly know all of the languages that currently exist or that have ever existed, we cannot say that such and such a type was impossible, unnatural, or has never existed” — that is to say, our “database” of linguistic systems will always be incomplete. Of course, there is no arguing with this line of reasoning. However, these linguists miss an important point: from all of the data that have been collected to date — from an extremely large sample of the world’s

languages — there emerge consistent, regular patterns that are repeated over and over again. There are, to be sure, typological rareties (cf. Wohlgemuth—Cysouw 2010), but these are less important (though no less interesting) from a statistical point of view. It is the regular patterning that has emerged from the analysis of the data from a great number of languages that is most important to Historical-Comparative Linguistics. These data are important in two respects: (A) they provide a control against which our reconstructions can be evaluated and (B), when part of a system has been reconstructed, they provide a means to deduce what the rest of the system might have been like, that is to say, they can be used as a discovery procedure by making use of "implicational universals". Concerning the consistent, regular patterning that has been observed, it should be noted that the basis for some of this patterning is human physiology, and, in such cases, we can speak of true universals. Given this regular patterning, it is disturbing when our reconstructions contradict it, as in the case of one form of the traditional reconstruction of Proto-Indo-European, for instance. To say merely that "Indo-European was a unique type" or some such statement only means that the person making such a statement chooses not to confront the issues involved. We should not hesitate to use every means at our disposal to help us arrive at realistic reconstructions. To be sure, we should be fully cognizant of the work of our predecessors and adhere closely to the time-honored methodologies — the Comparative Method and Internal Reconstruction — that have served Comparative-Historical Linguistics well since the days of Bopp, Rask, and Grimm. However, we must not stop here — we must also make full use of advances in phonological theory that have broadened our understanding of sound change and of new insights gained from typological studies, and our proposals must be consistent with the data. For a superb overview of the relevancy of typological studies to diachronic linguistics, cf. Schwink 1994.

In attempting to determine whether or not particular lexical items from the various language families might be related, I have made extensive use of Carl Darling Buck's *A Dictionary of Selected Synonyms in the Principal Indo-European Languages* as a control for the semantic development of the proposed lexical parallels. It may be noted that, in examining the lexicons of Kartvelian, Afrasian, Uralic-Yukaghir, Elamo-Dravidian, Altaic, and Eskimo-Aleut, semantic shifts similar to those described by Buck for the Indo-European languages are found over and over again in these other language families as well. I cannot emphasize strongly enough that, in order to gain a complete understanding of how I arrived at my proposals, Buck's dictionary must be consulted.

One final note is necessary. In recent years, several scholars (most notably, Donald Ringe and Sheila Embleton) have proposed techniques based upon statistical modeling and probability analysis as a means to help us judge the validity of our proposals concerning possible genetic relationship. Properly used, these techniques can indeed provide another valuable tool, which may be used along with, but not as a replacement for, established methodologies. Moreover, these techniques have the important advantage of introducing an objective set of criteria against which our proposals can be evaluated.

1.4. THE COMPARATIVE METHOD

In the previous section, we discussed the methodologies used in long-range linguistic comparison and showed that these are the same methodologies used in any other type of linguistic comparison. In this section, we will explore the Comparative Method in greater detail, repeating and expanding upon what was said in the previous section and using data from the Nostratic daughter languages to illustrate the principles involved.

First, let us begin with a formal definition of the Comparative Method (cf. Kimball 1992:274):

> COMPARATIVE METHOD examines items (e.g. phonemes, morphemes, or syntactic constructions) from two or more languages to establish genetic relationship and reconstruct ancestral forms. Unlike typological comparison, which ignores genetic affiliation, the comparative method assumes that the languages compared are (or may be) cognate languages: the descendants of a common ancestor.

Moreover, Hock (1991a:567) further defines the purpose of reconstruction:

> The ultimate proof of genetic relationship, and to many linguists' minds the only real proof, lies in the successful reconstruction of the ancestral forms from which the systematically corresponding cognates can be derived. (Note that just as in courts of law, the terms 'proof', 'prove' here are used in the sense of 'establish beyond a reasonable doubt'. In fact, the general tenet of historical linguistics is that all hypotheses, whether they concern genetic relationship, 'language-internal' developments like sound change or analogy, or contact-induced changes, should be established beyond a reasonable doubt. It must be admitted, however, that this tenet is often ignored in practice.)

Hock's statement is extremely important and pinpoints the crux of the problem in attempts to establish genetic relationship, especially long-range genetic relationship — it seems that no one can agree on the threshold beyond which "reasonable doubt" has been dispelled (cf. Greenberg 2005e). For some, the threshold is set so low that highly unlikely proposals can slip by, while, for others, the threshold is set so high that even well-established language families have difficulty passing — that is to say, they set impossible standards.

Next, Kimball (1992:275) notes that "[t]he comparative method makes three assumptions":

a) The relationship between sound and meaning is arbitrary; therefore, widespread similarity in form and meaning between two languages cannot be accidental.
b) Corresponding features of cognate languages continue features inherited from an ancestral stage or proto-language.
c) Completed sound changes are exceptionless.

As previously stated, the first step involves the arduous task of data gathering, placing special attention on gathering the oldest data available. Once a large amount of lexical material has been gathered, it must be carefully analyzed to try to separate what is ancient from what is an innovation and from what is a borrowing. This is not a simple task — the problem of borrowing is particularly acute within Altaic, for instance. Greenberg has addressed this problem by laying out two main techniques for detecting borrowed lexical items. First, he notes that borrowing is most commonly confined to certain semantic spheres (for example, cultural items) and certain grammatical categories (nouns far more often than verbs). Second, borrowed words can be distinguished from native vocabulary by expanding the range of comparison to include additional languages. Moreover, there are important clues that can assist us in identifying borrowings. First, a knowledge of the history or, in the case of reconstructed languages, the prehistory of a language can tell us which languages were in contact or might have been in contact with the language or languages under analysis at different stages in its history. Next, knowledge of the different levels of material culture achieved by population groups speaking these languages at particular times in their history will give us a clue about the probable direction of borrowings. Archeology can be of value here by providing us with a description of the artifacts of the material cultures in question, by giving us a glimpse of the salient characteristics of the societies using those artifacts, and by identifying probable trade routes and population movements.

Let us turn once again to Kimball (1992:275) to see what she has to say on this matter:

> However, languages can resemble each other for other reasons. Onomatopoetic words, 'baby-talk', and words showing sound symbolism are excluded from consideration; in these, the relationship between sound and meaning is not entirely arbitrary. Similarity can result from borrowing and other effects of language contact, or even from sheer chance — factors which must be eliminated in a list of potential cognates.
>
> Sometimes knowledge of the external history of a language allows us to exclude borrowing as a cause of similarity. For example, we know that many English words resemble French words because English has borrowed extensively from French since the 11th century. Where language contact is less well documented or prehistoric, similarity resulting from borrowing can be excluded with reasonable certainty by selecting items unlikely to have been borrowed. For instance, words referring to technology or material culture, which are often borrowed along with cultural or technological innovations, may make poor candidates for comparison. By contrast, basic vocabulary — kinship terms, numerals, pronouns, pre- and postpositions, and common verbs, adverbs, adjectives, and nouns — are less likely under most circumstances to be borrowed, and are usually more helpful to the comparativist.

After the native lexical elements have been reasonably identified in each phylum, the material can be compared across phyla to determine potential cognates. Once a

sufficient body of potential cognates have been identified, one can begin to work out the sound correspondences. Let us illustrate this by looking at a few cognates from the Nostratic languages (only the reconstructed forms will be given for each language group) — I have also included data from Sumerian:

1. Proto-Indo-European *b^h*or*-/*b^h*r̥*- ‘to bore, to pierce’; Proto-Afrasian **bur*- ‘to bore, to pierce’; Proto-Uralic **pura* ‘borer, auger’; Proto-Dravidian **pur*- ‘(vb.) to bore, to perforate; (n.) borer, gimlet’; Proto-Altaic **burV*- ‘to bore through, to pierce’. Cf. Sumerian *bùr* ‘to bore through, to pierce’.
2. Proto-Indo-European *b^h*er*-, *b^h*ru*- ‘brown’; Proto-Afrasian **bor*- ‘dark-colored’; Proto-Altaic *bor^yV- ‘gray, brown’ (< ‘dark-colored’).
3. Proto-Kartvelian **bur*- ‘to cover, to enclose’; Proto-Afrasian **bur*- ‘to cover, to wrap up’; Proto-Dravidian **pōr*- ‘(vb.) to wrap around (the body), to cover, to enclose; (n.) a cover, covering, wrapping’; Proto-Altaic **būri*- (~ -*i̯ū*-, -*e*) ‘to cover, to enclose’.
4. Proto-Indo-European *b^h*ek’*-/*b^h*ok’*- ‘to cut or split apart, to break apart’; Proto-Afrasian **bak’*- ‘to cleave, to split, to break open’; Proto-Dravidian **pak*- ‘to split, to rend; to be split’; Uralic: Proto-Finno-Ugrian **pakka*- ‘to burst, to rend, to split’; Eskimo-Aleut: Proto-Inuit **pakak*- ‘to knock into’.

The correspondence, in initial position, of Proto-Indo-European *b^h*-, Proto-Kartvelian **b*-, Proto-Afrasian **b*-, Proto-Uralic **p*-, Proto-Dravidian **p*-, Proto-Altaic **b*-, and Proto-Eskimo **p*- allows us to reconstruct Proto-Nostratic **b*-.

1. Proto-Indo-European *p^h*er*-/*p^h*or*-/*p^h*r̥*- ‘to fly, to flee’; Proto-Kartvelian **par*-, **pr-en*- ‘to fly’; Proto-Dravidian **par̲*- ‘to fly, to flee; to hasten, to hurry’.
2. Proto-Indo-European *p^h*er*-/*p^h*r̥*- ‘to bear, to bring forth’; Proto-Afrasian **pir*- ‘to bring forth, to bear fruit’; Proto-Dravidian **per̲*- ‘to get, to beget, to bear’; Proto-Altaic *p^h*ŭri* ‘seed, offspring’.
3. Proto-Indo-European *p^h*et^h*-/*p^h*ot^h*- ‘to fly, to rush, to pursue; to fall, to fall down’; Proto-Kartvelian **petk*- ‘to quiver, to tremble, to vibrate, to explode’; Proto-Afrasian **pat*- ‘to flutter, to quiver, to tremble; to fall down’; Proto-Dravidian **pat*- ‘to hurry; to flutter, to quiver, to shake; to be flurried, impatient, overhasty’; Proto-Eskimo **pattaγ*- ‘to clap or slap’.
4. Proto-Indo-European *p^h*es*-/*p^h*os*- ‘penis’; Uralic: Proto-Finno-Ugrian *$pas^yз$ ‘penis’; Proto-Dravidian **pă(y)*-/**pac*- ‘descendant, offspring’; Proto-Altaic *p^h*[i̯a]s*- (?) ‘male genitals’. Cf. Sumerian *peš* ‘sperm, semen’, *peš* ‘son, descendant, offspring’.

In these examples, the correspondence, in initial position, of Proto-Indo-European *p^h*-, Proto-Kartvelian **p*-, Proto-Afrasian **p*-, Proto-Uralic **p*-, Proto-Dravidian **p*-, Proto-Altaic *p^h*-, and Proto-Eskimo **p*- allows us to reconstruct Proto-Nostratic *p^h*-.

1. Proto-Indo-European **me-*/**mo-* 1st person personal pronoun stem (oblique cases); Proto-Kartvelian **me-*, **men-* 1st person personal pronoun stem; Proto-Afrasian **m[i]-* 1st person personal pronoun stem (only in Chadic, with relics in Cushitic); Proto-Uralic **me* 1st person singular personal pronoun stem: 'I, me', **me* 1st plural personal pronoun stem; Proto-Altaic (nom. sg.) (**mi* >) **bi* 'I', (oblique stem) **min-*; Proto-Chukchi-Kamchatkan **(kə-)m* 'I' (**kə-* is a marker of independent pronouns); Eskimo-Aleut: West Greenlandic 1st sg. relative possessive suffix *-ma*. Note here also Etruscan *mi* 'I', *mini* 'me' and Sumerian (Emesal) *ma(-e)*, *me-a*, *me-e* 'I', (1st pl. possessive suffix) *-me* 'our'.
2. Proto-Indo-European **mo-* demonstrative stem (preserved vestigially in Celtic); Proto-Kartvelian **ma-* demonstrative stem: 'this, he'; Proto-Finno-Ugrian **mu* 'other, another'; Altaic: Common-Turkic (nom. sg.) (**mū*/**mō* >) **bū*/**bō* 'this', (oblique stem) **mu-n-*; Mongolian *mön* deictic word serving as a demonstrative pronoun, adjective, adverb, and copula.
3. Proto-Indo-European **me-*/**mo-* interrogative and relative pronoun stem (preserved in Hittite and Tocharian, with vestiges in Celtic); Proto-Kartvelian **mi-n-* interrogative pronoun, **ma-* 'what'; Proto-Afrasian **ma-* ~ **mi-* relative and interrogative pronoun stem; Proto-Uralic **mi* interrogative and relative pronoun stem; Proto-Altaic **mV* interrogative stem; Proto-Eskimo enclitic particle **mi* 'what about?'. Cf. Sumerian *me-na-àm* 'when?', *me-a* 'where?', *me-šè* 'where to?'.
4. Proto-Indo-European **mer-*/**mor-* 'to twist, to turn'; Proto-Afrasian **m[u]r-* 'to twist, to turn'; Proto-Dravidian **mur-* 'to bend, to be bent, to turn round, to twist; (n.) rope, cord; bend, curve', **mur-* 'to twist, to twine, to tighten'; Proto-Altaic **mura-* '(vb.) to turn, to return; (adj.) round'.

Here, the correspondence, in initial position, of Proto-Indo-European **m-*, Proto-Kartvelian **m-*, Proto-Afrasian **m-*, Proto-Uralic **m-*, Proto-Dravidian **m-*, Proto-Altaic **m-*, and Proto-Eskimo **m-* allows us to reconstruct Proto-Nostratic **m-*.

These correspondences can be summarized as follows:

PN	PIE	PK	PAA	PU	PD	PA	PE
b-	b^h-	b-	b-	p-	p-	b-	p-
p^h-	p^h-	p-	p-	p-	p-	p^h-	p-
m-	m-	m-	m-	m-	m-	m-	m-

Abbreviations: PN = Proto-Nostratic; PIE = Proto-Indo-European; PK = Proto-Kartvelian; PAA = Proto-Afrasian; PU = Proto-Uralic; PD = Proto-Dravidian; PA = Proto-Altaic; PE = Proto-Eskimo.

Not only must the regular sound correspondences (that is, those that occur consistently and systematically) be defined (a full set of Nostratic sound correspondences can be

found at the end of Chapter 12), exceptions must also be explained. Here, widely-attested sound changes (palatalization, assimilation, metathesis, dissimilation, syncope, etc.) provide the key to understanding the origin of most exceptions. In other cases, the analysis of the influence that morphology has exerted provides an understanding of how particular exceptions came into being. Some exceptions, though clearly related, simply defy explanation. All of these must be noted. The final step involves the reconstruction of ancestral forms and the formulation of the sound laws leading to the forms in the descendant languages, identifying the laws that have produced the regular sound correspondences as well as the exceptions. The same principles apply to the reconstruction of grammatical forms and rules of combinability and to the identification of the historical transformations leading to the systems found in the daughter languages.

Let us now look at some exceptions to the regular sound correspondences that have been established and provide explanations for these exceptions:

1. Pre-Proto-Indo-European *k^hab- > (with progressive voicing assimilation) Proto-Indo-European *k^hap^h-*ro*- ‘he-goat, male sheep, buck, ram’ ~ Proto-Afrasian **kab*- ‘he-goat, male sheep, buck, ram’.

In this example, the correspondence of Proto-Indo-European *-p^h- ~ Proto-Afrasian *-*b*- is irregular — instead, we would expect Proto-Indo-European *-b^h- as the regular correspondence of Proto-Afrasian *-*b*-. Now, it is well-known that Indo-European had a root-structure constraint against the appearance of both a voiced (aspirated) stop and a voiceless (aspirated) stop in a root, that is to say, that they had to agree in voicing (cf. Benveniste 1935:170; Lehmann 1952:17) — thus, *t^heb^h- and *b^het^h- (traditional **tebh*- and **bhet*-) were not allowed. However, comparison with the other Nostratic languages indicates that the forbidden root types must have once existed. Therefore, a rule of progressive voicing assimilation may be set up to account for the elimination of the forbidden root types. This means that *t^heb^h- would have become *t^hep^h-, and *b^het^h- would have become *b^hed^h-. This is confirmed by other examples, such as:

2. Pre-Proto-Indo-European *d^yək^{wh}-/*d^yak^{wh}- > (with progressive voicing assimilation and depalatalization of initial *d^y) Proto-Indo-European *d^heg^{wh}-/*d^hog^{wh}- ‘to blaze, to burn’ ~ Proto-Afrasian *d^yak^w- ‘to blaze, to be bright’.

Another exception is found in the following examples:

3. Proto-Indo-European *(s)t^hek’-/*(s)t^hok’- ‘to cover’ ~ Proto-Kartvelian *t’q’aw- ‘skin, hide’; Proto-Afrasian *t’ak’- ‘to cover, to obscure’.
4. Proto-Indo-European *t^hek’-/*t^hok’- ‘to knock, to beat, to strike’ ~ Proto-Kartvelian *t’k’$ač$- ‘to hit, to strike’; Proto-Afrasian *t’uk’-, *t’ok’- ‘to knock, to beat, to strike, to pound’; Proto-Finno-Ugrian *$tukɜ$- (*$tuγɜ$-) ‘to break, to crush’; Proto-Dravidian **tuk*- ‘to tread down, to trample on, to step on; to beat,

to strike, to pound, to mash', **tukk-* 'to push, to shove'. Cf. Sumerian *dug$_4$-ga* 'to strike, to beat, to hit, to smite, to kill'.

In these examples, the correspondence of Proto-Indo-European **t^h-* ~ Proto-Kartvelian **t'-* and Afrasian **t'-* is irregular — instead, we would expect Proto-Indo-European **t'-* as the regular correspondence of Proto-Kartvelian **t'-* and Proto-Afrasian **t'-*. In traditional terms, Proto-Indo-European had a constraint against the appearance of two plain voiced stops within a root (cf. Benveniste 1935:170; Lehmann 1952:17), that is to say that a root could not both begin and end with a plain voiced stop. In terms of the Glottalic Theory (see Chapter 3, §3.4, for a discussion of the Glottalic Theory), this constraint is reinterpreted as a restriction against the co-occurrence of two glottalics in a root. This means that roots of the type **t'ek'-* (**deg-* in traditional terms) are not allowed. It may be noted that a similar constraint is found in a number of other languages having glottalics. However, comparison with the other Nostratic languages indicates that the forbidden root types must have once existed. Therefore, a rule of regressive deglottalization may be set up to account for the elimination of the forbidden root types in Proto-Indo-European. This means, for example, that **t'ek'-* would have become **t^{h}ek'-*. This rule finds a close parallel in Geers' Law in Akkadian (for details on Geers' Law, cf. Ungnad—Matouš 1969:27 and 1992:26—27). It may be noted that Geers' Law also operated in Eblaite (cf. Zemánek 1998:56).

Now, up until this point, we have been using mostly reconstructed forms to illustrate the principles involved in the Comparative Method. However, reconstructed forms contain a sufficiently high enough margin of error by their very nature to render such comparisons suspect. This means that, ultimately, we must base our conclusions about possible genetic relationship on an examination and analysis of the actual attested forms found in each daughter language. It is my contention that a comparison based on the actual attested forms alone, without recourse to the reconstructed forms, is sufficient to demonstrate the genetic relationship of the various Nostratic daughter languages. Let us illustrate this by looking at the data which support the reconstructions given in several of the examples above — we will look at one from each set.

First, let us look again at the words for 'to bore, to pierce':

1. a) Proto-Indo-European **b^{h}or-*/**b^{h}r̥-* 'to bore, to pierce';
   b) Proto-Afrasian **bur-* 'to bore, to pierce';
   c) Proto-Uralic **pura* 'borer, auger';
   d) Proto-Dravidian **pur-* '(vb.) to bore, to perforate; (n.) borer, gimlet';
   e) Proto-Altaic **burV-* 'to bore through, to pierce'.

Here are some of the attested data from within each language family to support this example (for a more complete set of data, cf. Chapter 22, no. 74):

a) Indo-European: Old English *borian* ‘to bore, to pierce’; Old High German *boro* ‘auger’; Latin *forō* ‘to bore, to pierce’ (Latin *f-* < **b^{h}-*); Greek φαρόω, φαράω ‘to plow’.
b) Afrasian: Aramaic *bəraz* ‘to bore, to pierce’; Tigre (reduplicated) *bärabära* ‘to pierce’; Geez / Ethiopic *barra* [በረረ], *barara* [በረራረ] ‘to pierce, to penetrate, to go through’; Somali *burur* ‘broken piece’; Saho *burūr* ‘broken piece’.
c) Uralic: Finnish *pura* ‘borer, auger, (big) awl’; Vogul / Mansi *pore*, *porä* ‘awl’; Ostyak / Xanty *põr* ‘borer, auger’; Hungarian *fúr-* ‘to bore, to drill’; Yurak Samoyed / Nenets *parõ* ‘borer, auger’; Selkup Samoyed *pur* ‘borer, auger’.
d) Dravidian: Tamil *purai* ‘tubular hollow, tube, pipe, windpipe’; Tuḷu *perevuni* ‘to be bored, to be perforated’, *perepini* ‘to bore to perforate’, *burma*, *burmu* ‘a gimlet’, *berpuri* ‘borer, auger’.
e) Mongolian *burγui-* ‘a piece of wire used to clean a smoking pipe’; Turkish *bur-* ‘to bore a hole’; Tatar *borau* ‘borer, auger’.

Cf. Sumerian *bùr* ‘to bore through, to pierce’.

The second example which we will explore in depth is the words for ‘to flee, to fly’:

2. a) Proto-Indo-European **p^{h}er-*/**p^{h}or-*/**p^{h}r̥-* ‘to fly, to flee’;
   b) Proto-Kartvelian **par-*, **pr-en-* ‘to fly’;
   c) Proto-Dravidian **paṟ-* ‘to fly, to flee; to hasten, to hurry’.

Here are some of the attested data from within each language family to support this example (for a more complete set of data, cf. Chapter 22, no. 102):

a) Indo-European: Sanskrit *parṇá-ḥ* ‘wing, feather’; Hittite *pár-aš-zi* ‘to flee’; Russian Church Slavic *perǫ*, *pъrati* ‘to fly’, *pero* ‘feather’; Czech *perchnouti* ‘to flee’; Polish *pierzchnać* ‘to flee’; Serbo-Croatian *prhati* ‘to fly up’; Russian *porxát'* [порхать] ‘to flit, flutter, to fly about’.
b) Kartvelian: Georgian *pr-ena* ‘to fly’, *(m)prinveli* ‘bird’; Mingrelian *purin-* ‘to fly’; Laz *purtin-* ‘to fly’.
c) Dravidian: Tamil *paṟa* ‘to fly, to hover, to flutter, to move swiftly, to hasten, to be in a hurry; to be greatly agitated; to be scattered, dispersed; to disappear’, (reduplicated) *paṟapaṟa* ‘to hasten, to hurry’, *paṟavai* ‘bird, wing, feather, bee’; Malayalam *paṟakka* ‘to fly, to flee’; Kannaḍa *paṟi*, *paṟu* ‘flying, running swiftly’; Tuḷu *pāruni* ‘to run, to fly, to escape’; Telugu *paṟacu* ‘to run away, to flee, to flow; to cause to escape’, *pāṟu* ‘to run, to flow’.

The final example is the words for ‘I, me’:

3. a) Proto-Indo-European **me-*/**mo-* 1st person personal pronoun stem (oblique cases);
   b) Proto-Kartvelian **me-*, **men-* 1st person personal pronoun stem;
   c) Proto-Afrasian **m[i]-* 1st person personal pronoun stem (only in Chadic, with relics in Cushitic);
   d) Proto-Uralic **me* 1st person singular personal pronoun stem: 'I, me', **me* 1st plural personal pronoun stem;
   e) Proto-Altaic (nom. sg.) (**mi* >) **bi* 'I', (oblique stem) **min-*;
   f) Proto-Chukchi-Kamchatkan **(kə-)m* 'I' (**kə-* is a marker of independent pronouns);
   g) Etruscan *mi* 'I', *mini* 'me'.

Here are some of the attested data from within each language family to support this example (for a more complete set of data, cf. Chapter 22, no. 892):

a) Indo-European: Sanskrit (acc. sg.) *mā*, *mā́m* 'me'; Greek (acc. sg.) με, ἐμέ 'me'; Latin (acc.-abl. sg.) *mē* 'me'; Gothic (acc. sg.) *mik* 'me'; Lithuanian (acc. sg.) *manę* 'me'; Old Church Slavic (acc. sg.) *mę*, *mene* 'me'.
b) Kartvelian: Old Georgian *me* 'I'; Mingrelian *ma-* 'I'; Laz *ma*, *man* 'I'; Svan *mi* 'I'.
c) Afrasian: Chadic: Hausa (pl.) *maa* 'we', (indirect object pl.) *manà* 'us, to us, for us', (pl.) *muu* 'we, us, our', (past tense subj. pl.) *mun* 'we', (continuous tense subj. pl.) *munàa* 'we'; (indirect object sg.) *minì* 'me, to me, for me'; Kotoko *mi* 'we, us'; Mandara *ma* 'we, us'; Musgu *mi* 'we, us', *mu* 'I, me'; Bole *mu* 'we, us'.
d) Uralic: Finnish *minä*/*minu-* 'I, me'; Lapp / Saami *mon*/*mú-* 'I, me'; Mordvin *mon* 'I, me'; Zyrian / Komi *me* 'I', (acc.) *menõ* 'me'; Selkup Samoyed *man*, *mat* 'I, me'; Kamassian *man* 'I, me'; Yukaghir *met* 'I, me'.
e) Altaic: Mongolian (nom. sg.) *bi* 'I', (gen. sg.) *minu* 'my, of me', (gen. pl. exclusive) *manu* 'our, of us'; Manchu *bi* 'I, me', (gen. sg.) *mini* 'my'; Old Turkish (nom. sg.) *män* (rarely *bän*) 'I', (acc. sg.) *mäni* 'me'.
f) Chukchi *γə-m* 'I' (in predication: *-iγəm* ~ *-eγəm*).
g) Etruscan *mi* 'I', *mini* 'me'.

Cf. Sumerian (Emesal) *ma(-e)*, *me-a*, *me-e* 'I', (1st pl. possessive suffix) *-me* 'our'.

It is thus perfectly clear that we are able to establish phonological correspondences on the basis of an analysis of the actual attested data from the individual Nostratic daughter languages alone, without recourse to reconstructions. Moreover, not only are we able to establish the regular sound correspondences by such an analysis, we are also able to identify and explain exceptions. And, it is on this basis as well that we are able to reconstruct the Proto-Nostratic forms. This is identical to what was done in Indo-European and which continues to be done in Comparative-Historical Linguistics — the Indo-European parent language was reconstructed on the basis of

a direct comparison of the actual attested data from the individual Indo-European daughter languages without recourse to reconstructed Proto-Indo-Iranian, Proto-Italic, Proto-Greek, Proto-Germanic, etc. That is to say that it was not necessary to reconstruct every intermediary level before one could tackle the problems of reconstructing the Indo-European parent language. Of course, reconstruction is still both important and necessary. Reconstruction, including the reconstruction of intermediary levels, allows us to make powerful statements about the (pre)historical development of each daughter language, especially about how and why particular features came into being or became extinct. Finally, the understanding of what has taken place historically in one daughter language often provides an explanation of what has taken place in another daughter language.

In any attempt to establish genetic relationship, one is going to come across chance resemblances. By "chance resemblances", one means unexpected, and sometimes rather striking, instances of identical or nearly identical vocabulary items or, in rare cases, even grammatical forms in two or more totally unrelated languages or in languages that, if they are related, are distant enough apart to make it otherwise unlikely that they would share such items. The example that Kimball (1992:275) gives is the word for 'man', *wiro*, in the extinct Timucua language, formerly spoken in northern Florida and southeastern Georgia, which resembles Latin *vir* 'man'. Chance resemblances of this type do occur and, it goes without saying, do not indicate genetic relationship. Chance resemblances can range from a mere handful of examples up to several dozen depending upon how much latitude one is willing to allow in both forms and meanings. As noted above, one of the main assumptions of the Comparative Method is that "the relationship between sound and meaning is arbitrary; therefore, widespread similarity in form and meaning between two languages cannot be accidental". Thus, when the languages under analysis exhibit a large number of recurrent sound-meaning correspondences, we are not dealing with chance resemblances.

1.5. CRITIQUE OF MOSCOVITE VIEWS ON NOSTRATIC

Let me begin by stating unequivocally that I have the highest admiration for what Moscovite scholarship (especially the work of V. M. Illič-Svityč and A. B. Dolgopolsky — some of the work done by other Russian scholars is not on the same level) on Nostratic has achieved. Their research has opened up new and exciting possibilities and given Nostratic studies new respectability. However, this does not mean that I agree with everything they say. I regard their work as a pioneering effort and, as such, subject to modification in light of advances in linguistic theory, in light of new data from the Nostratic daughter languages, and in light of findings from typological studies that give us a better understanding of the kind of patterning that is found in natural languages as well as a better understanding of what is characteristic of language in general, including language change.

Let us begin by looking at phonology: In 1972 and 1973, the Georgian scholar Thomas V. Gamkrelidze and the Russian scholar Vjačeslav V. Ivanov jointly proposed a radical reinterpretation of the Proto-Indo-European stop system. According to their reinterpretation, the Proto-Indo-European stop system was characterized by the three-way contrast glottalized ~ voiceless (aspirated) ~ voiced (aspirated). In this revised interpretation, aspiration is viewed as a redundant feature, and the phonemes in question could also be realized as allophonic variants without aspiration. Paul J. Hopper made a similar proposal at about the same time (Hopper 1973). I should point out here that, even though I support the revisions proposed by Gamkrelidze, Hopper, and Ivanov, my views are not dependent upon any particular reconstruction of the Proto-Indo-European stop system — the sound correspondences I have proposed can be maintained using the traditional reconstruction as well. What the new views of Proto-Indo-European consonantism did was bring into light the implausibility of certain Nostratic sound correspondences established by Illič-Svityč and Dolgopolsky (see below for details). Moreover, this new interpretation opened new possibilities for comparing Proto-Indo-European with the other Nostratic daughter languages, especially Proto-Kartvelian and Proto-Afrasian, each of which had a similar three-way contrast. The simplest and most straightforward assumption would be that the glottalized stops posited by Gamkrelidze, Hopper, and Ivanov for Proto-Indo-European would correspond to glottalized stops in Proto-Kartvelian and Proto-Afrasian, while the voiceless stops would correspond to voiceless stops and voiced stops to voiced stops. This, however, is quite different from the correspondences proposed by Illič-Svityč and Dolgopolsky. They see the glottalized stops of Proto-Kartvelian and Proto-Afrasian as corresponding to the traditional plain voiceless stops of Proto-Indo-European, while the voiceless stops in the former two branches are seen as corresponding to the traditional plain voiced stops of Proto-Indo-European, and, finally, the voiced stops to the traditional voiced aspirates of Proto-Indo-European. Illič-Svityč and Dolgopolsky then reconstruct the Proto-Nostratic phonological system on the model of Kartvelian and Afrasian, with the three-way contrast glottalized ~ voiceless ~ voiced in the series of stops and affricates.

The mistake that Illič-Svityč and Dolgopolsky made was in trying to equate the glottalized stops of Proto-Kartvelian and Proto-Afrasian with the traditional plain voiceless stops of Proto-Indo-European. Their reconstruction would make the glottalized stops the least marked members in the Proto-Nostratic bilabial series and the most marked in the velar series. Such a reconstruction is thus in contradiction to typological evidence, according to which glottalized stops uniformly have the opposite frequency distribution (most marked in the bilabial series and least marked in the velar series [for details, cf. Gamkrelidze 1978]). The reason that Illič-Svityč's and Dolgopolsky's reconstruction contradicts the typological evidence is as follows: Illič-Svityč and Dolgopolsky posit glottalics for Proto-Nostratic on the basis of a small number of seemingly solid examples in which glottalics in Proto-Afrasian and/or Proto-Kartvelian appear to correspond to traditional plain voiceless stops in Proto-Indo-European. On the basis of these examples, they assume that,

whenever there is a voiceless stop in the Proto-Indo-European examples they cite, a glottalic is to be reconstructed for Proto-Nostratic, even when there are no glottalics in the corresponding Kartvelian and Afrasian forms! This means that the Proto-Nostratic glottalics have the same frequency distribution as the Proto-Indo-European plain voiceless stops. Clearly, this cannot be correct. The main consequence of the mistaken comparison of the glottalized stops of Proto-Kartvelian and Proto-Afrasian with the traditional plain voiceless stops of Proto-Indo-European is that Illič-Svityč and Dolgopolsky are led to posit forms for Proto-Nostratic on the basis of theoretical considerations but for which there is absolutely no evidence in any of the daughter languages. The following examples illustrate the ad hoc nature of these reconstructions:

1. Dolgopolsky (1998:17) reconstructs a second singular personal pronoun **ṭü* > **ṭi* 'thou', with an initial glottalized dental, on the basis of data from Indo-European, Afrasian, Uralic, and Mongolian. When one looks at the attested forms in the daughter languages, one cannot find a single form anywhere that begins with a glottalized consonant. Indeed, in natural languages having glottalized consonants, these sounds tend to be underrepresented in pronoun stems and inflectional affixes. What, then, is the basis for the reconstruction **ṭü*? — nothing more than an ad hoc rule set up by Illič-Svityč.
2. Dolgopolsky (1998:17) also reconstructs an interrogative stem **ḳo-* 'who?' (see also Illič-Svityč 1971—1984.I:355—356, no. 232, **Ḳo* 'who'). As in the preceding example, there is no evidence in any of the Nostratic daughter languages to support the reconstruction of an initial glottalized velar here.

Do these criticisms completely invalidate the cognate sets proposed by Illič-Svityč and Dolgopolsky in which glottalics in Kartvelian and Afrasian appear to correspond to plain voiceless stops in Indo-European? Well, no, not exactly — it is not quite that simple. In some cases, the etymologies are correct, but the Proto-Nostratic reconstructions are wrong. This applies to the examples cited above — for the second person personal pronoun, I would reconstruct Proto-Nostratic **t^{h}i*, and, in place of **ḳo-* 'who?', I would reconstruct Proto-Nostratic **k^{wh}a-*. Other examples adduced by Illič-Svityč and Dolgopolsky admit alternative explanations, while still others are questionable from a semantic point of view and should be abandoned. Once the questionable examples are removed, there is an extremely small number (no more than a handful) left over that appear to support their position. However, compared to the massive counter-evidence in which glottalized stops in Kartvelian and Afrasian correspond to similar sounds (the traditional plain voiced stops) in Proto-Indo-European, even these residual examples become suspect (they may be borrowings or simply false cognates). Finally, there are even some examples where Dolgopolsky's and Illič-Svityč's comparison of glottalized stops in Proto-Kartvelian and Proto-Afrasian with plain voiceless stops in Proto-Indo-European is correct. This occurs in the cases where two glottalics originally appeared in a Proto-Nostratic root: **C'VC'-*. Such roots are preserved without

change in Proto-Kartvelian and Proto-Afrasian, while in Proto-Indo-European, they have been subject to a rule of regressive deglottalization: **C'VC'- > *CVC'-*.

Another major shortcoming is in Illič-Svityč's reconstruction of the Proto-Nostratic vowel system, which, according to him, is essentially that of modern Finnish. It simply stretches credibility beyond reasonable bounds to assume that the Proto-Nostratic vowel system could have been preserved unchanged in Finnish, especially considering the many millennia that must have passed between the dissolution of the Nostratic parent language and the emergence of Finnish (Serebrennikov 1986:75 makes the same point). No doubt, this erroneous reconstruction came about as a result of Illič-Svityč's failure to deal with the question of subgrouping. The Uralic-Yukaghir phylum, of which Finnish is a member, belongs to the Eurasiatic branch of Nostratic. Now, Eurasiatic is several millennia younger than Afrasian, which appears to be the oldest branch of the Nostratic macrofamily. Therefore, Afrasian must play a key role in the reconstruction of the Proto-Nostratic vowel system, and the Uralic-Yukaghir vowel system must be considered a later development that cannot possibly represent the original state of affairs.

In closing, we may note that Alexis Manaster Ramer (1997:94—96) arrived at the same conclusions reached here regarding the need to reexamine the Nostratic sound correspondences proposed by Illič-Svityč (and, by implication, Dolgopolsky as well) in light of typological considerations. Specifically, he writes:

> 6.1. Finally, quite recently, I decided to see what would happen if one counted up the occurrences of the different stops (voiceless vs. voiced vs. glottalized as well as labial vs. coronal vs. velar) reconstructed for Nostratic by Illich-Svitych. I only performed the experiment on root-initial stops, with the following results: (they are given as approximations because there is a problem arriving at exact figures given that there [are] some cases where it is difficult to tell whether one is dealing with a single Nostratic form or two, or whether a particular form should begin with this or that stop):
>
> | | | |
> |---|---|---|
> | *b 50+ | *d 20+ | *g 40+ |
> | *p 15+ | *t 15+ | *k 50+ |
> | *p' 40+ | *t' 30+ | *k' 60+ |
>
> The first observation (see Manaster Ramer in press a) was that … the relative frequencies of the three phonation types (voiced, voiceless, glottalized) posited for Proto-Nostratic stops, as reflected in the sets of cognates compiled by Illich-Svitych, seem to be inconsistent with typological predictions. Specifically, at least in initial position, the series of stops reconstructed as glottalized is much more frequent at all points of articulation than the series reconstructed as (plain) voiceless.
>
> Since one expects glottalized stops to be more marked and hence less frequent than plain voiceless, in particular, something was amiss. However, just as in the case of the clusters and affricates discussed above, the solution turned out to be quite simple. Given the markedness considerations, I would

suggest that the "glottalized" series was actually plain voiceless in Proto-Nostratic, while the "voiceless" series represented some more marked phonation type, glottalized or perhaps aspirated. This is consistent with the fact that the Nostratic series Illich-Svitych wrote as "glottalized" is in fact realized as glottalized only in parts of Afro-Asiatic and in Kartvelian, and in the latter it is easy to imagine that this could be a contact-induced development.

This reinterpretation of Nostratic … naturally calls to mind the glottalic theory of Indo-European. As it happens, the stop series reconstructed by Illich-Svitych as plain voiceless and by me as glottalized (or aspirated) comes out in Proto-Indo-European as that series of stops which is traditionally reconstructed as voiced (media) but which many scholars have recently interpreted as glottalized.

Nostratic (Illich-Svitych)	Nostratic (Manaster Ramer)	Indo-European (Traditional)	Indo-European (Glottalic)
*t	*t' (or *t^h)	*d	*t'
*t'	*t	*t	*t
*d	*d	*dh	*d

Totally unexpectedly, typological considerations provide us with arguments for reinterpreting the Nostratic stop series in a way that fits quite well with the glottalic theory of Indo-European. Of course, there is no reason in general to expect the phonetics of related languages and proto-languages to agree in this way, and such a convergence cannot be regarded as a criterion or an argument for relatedness among languages, since that would entail the "misuse of similarity" which Hamp (1992) cautions against. But it is not an unwelcome development when it occurs.

1.6. EVIDENCE FOR NOSTRATIC

The following evidence provides the basis for setting up a Nostratic macrofamily:

1. First and foremost, the descendant languages can be shown to share a large common vocabulary. In an article published in 1965, Illič-Svityč listed 607 possible common Nostratic roots, but only 378 etymologies were included in his posthumous comparative Nostratic dictionary. It should be noted that there are differences between the etymologies proposed in 1965 and the items included in the later dictionary: first, some of the items listed in 1965 do not appear in the dictionary; next, minor changes were made to several of the earlier etymologies. At the time of his death, Dolgopolsky had gathered data to support a little over 3,000 common Nostratic roots in his *Nostratic Dictionary* (a draft of which is now available on-line). In the joint monograph (1994) by myself and John C. Kerns, entitled *The Nostratic Macrofamily: A Study in Distant Linguistic Relationship*, I supplied a great deal of lexical material from

the Nostratic daughter languages to support 601 common Nostratic roots — there are 964 in the current book. It should be mentioned here as well that, in Volume 2 (2002) of his book *Indo-European and Its Closest Relatives: The Eurasiatic Language Family*, Greenberg also presents a substantial body of lexical material, though Greenberg's Eurasiatic is not the same as Nostratic.

2. As is to be expected, the various branches of Nostratic investigated to date exhibit regular sound correspondences (see the table of Nostratic sound correspondences at the end of Chapter 12 for details), though, it should be mentioned, there are differences in interpretation between Illič-Svityč and Dolgopolsky on the one hand and myself on the other.
3. Finally, a substantial number of common grammatical formants have now been recovered — many of these are listed in Illič-Svityč's comparative Nostratic dictionary; see also Bomhard—Kerns 1994:141—190; Greenberg 2000; Dybo 2004; Bomhard 2002a , 2004c, 2015a; Dolgopolsky 2005 and 2008. Some of these formants are also examined in Fortescue 1998 and 2011 and Kortlandt 2010a (various papers). The grammatical formants that have been recovered to date are discussed in detail in Chapter 16 of this book, while a systematic reconstruction of Proto-Nostratic morphology is attempted in Chapter 17.

Notable among the lexical items uncovered by Illič-Svityč, Dolgopolsky, Greenberg, and myself is a solid core of common pronominal stems (these are listed below in Table 1 at the end of this chapter, though only the stems represented in Indo-European are given — the Proto-Nostratic reconstructions are given according to my system; for information on other pronoun stems, cf. Dolgopolsky 1984). These pronominal stems have particular importance, since, as forcefully demonstrated by John C. Kerns (1985:9—50), pronouns, being among the most stable elements of a language, are a particularly strong indicator of genetic relationship (Ruhlen 1994a:92—93 makes the same point). Kerns (1985:48) concludes (the emphasis is his):

> The results are overwhelming. We are forced to conclude that the pronominal agreements between Indo-European and Uralic, between Uralic and Altaic, and between Indo-European and Altaic, did not develop independently, but instead were CAUSED by some UNIQUE historical circumstance. In short, it is extremely unlikely that the three pronominal systems could have evolved independently.

Likewise, Collinder (1966:200):

> It has been said that identical pronouns do not even give an indication of affinity, because you will find such identities anywhere, even if you compare two manifestly unrelated languages. The random checks I have made seem to indicate that this does not hold good. Outside the nostratic group, there are identities, but only a few, from one to four. Within the nostratic group the number of identities varies from, let us say, seven to ten. As the probability of

> mere chance decreases in geometric, not in arithmetic, proportion to the increasing number of identities, seven to ten identities means quite another level of probability than one to four.

The conclusion seems inescapable that the consistent, regular phonological correspondences that can be shown to exist among the Nostratic daughter languages as well as the agreements in vocabulary and grammatical formants that have been uncovered to date cannot be explained as due to linguistic borrowing or mere chance but can only be accounted for in terms of common origin, that is, genetic relationship. To assume any other possibility would be tantamount to denying the efficacy of the Comparative Method. This does not mean that all problems have been solved. On the contrary, there remain many issues to be investigated and many details to be worked out, but the future looks extremely exciting and promising.

At this stage of research, we can confidently say that the following languages/ language families are to be included in the Nostratic macrofamily: Afrasian, Elamo-Dravidian, Kartvelian, and Eurasiatic. Eurasiatic, in turn, includes the following: Tyrrhenian, Indo-European, Uralic-Yukaghir, Altaic, Chukchi-Kamchatkan, Gilyak (Nivkh), and Eskimo-Aleut. Each of these languages/language families will be discussed in more detail in Chapter 2. The Nostratic family tree may be represented as follows (note here, for comparison, the computer-generated family tree given by Starostin [1999c:66]):

CHART 1: THE NOSTRATIC MACROFAMILY

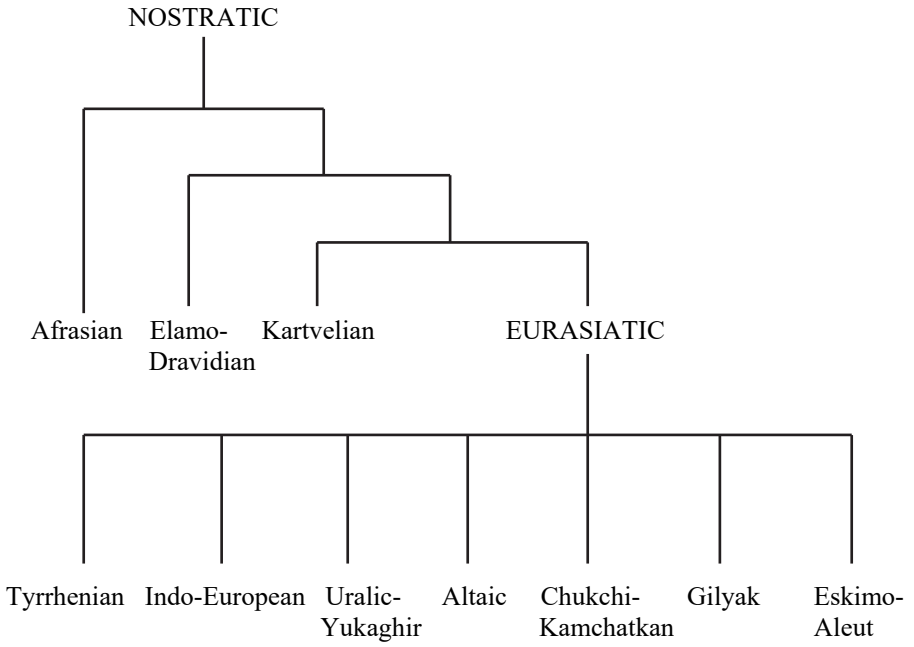


TABLE 1: THE DISTRIBUTION OF NOSTRATIC PRONOUN STEMS

A. PERSONAL PRONOUN STEMS

Proto-Nostratic	Proto-IE	Proto-Kartv.	Proto-Afrasian	Proto-Uralic	Proto-Dravid.	Proto-Altaic	Sum.
**mi-/ *me-* (1st sg.)	**me-/ *mo-*	**me-*, **men-*	**m[i]-*	**me*		**mi* (> **bi*)	*ma(e)*, *me-a*, *me-e*
**ma-/ *mə-* (1st pl. incl.)	**-me-/ *-mo-*		**ma-*	**me*		**ma-* (> **ba-*)	*-me*
**wa-/ *wə-* (1st pl.)	**we-/ *wo-*; **wey-*		**wa-*				
**na-/*nə-* (1st pl.)	**ne-/*no-*; **n̥-s-*		**na-*		**nă̄m-*		
**t^hi-/ *t^he-* (2nd sg.)	**t^hŭ̄*, **t^he-*		**ti-*	**te*		**t^hi*, **t^ha*	*za-e*, *-zu*

Notes:

1. Indo-European: The 1st sg. stem **mi-/*me-* is used in the oblique cases (except in the Celtic branch, where it has spread into the nominative as well); the 1st pl. inclusive stem **ma-/*mə-* is preserved in 1st person plural verb endings; the 1st pl. stem **wa-/*wə-* is preserved as an independent 1st person plural pronoun stem and in 1st person dual and/or plural verb endings; the 2nd sg. reconstructions **t^hŭ̄*, **t^he-* 'thou, you' represent later, Post-Anatolian forms — the forms found in the Anatolian languages are based upon **t^hi-* 'thou, you'.
2. Kartvelian: The 1st pl. stem **na-/*nə-* is found in Svan *näj* 'we'.
3. Afrasian: The 1st sg. stem **mi-/*me-* and 1st pl. inclusive stem **ma-/*mə-* are found only in Chadic as independent pronouns; the 1st sg. stem **mi-/*me-* serves as the basis of the 1st sg. verbal suffix in Highland East Cushitic; the 1st pl. stem **wa-/*wə-* is found in Egyptian and Chadic (in Egyptian, *wy* means 'I, me').
4. Elamo-Dravidian: The 2nd sg. stem **t^hi-/*t^he-* is found in Elamite in the 2nd sg. and pl. personal class marker *-t(i/a)* (cf. Khačikjan 1998:34) and in Dravidian in, for example, the Parji appositional marker *-t* of the 2nd sg. in pronominalized nouns and as a verb suffix of the 2nd sg.
5. Altaic: The 1st sg. stem **mi-* has become **bi* 'I' in the Altaic daughter languages, while the 1st pl. stem **ma-* has become *ba* in Mongolian (= 1st pl.

exclusive); the initial **m-* is preserved in the oblique cases, however; the 2nd sg. stem **t^hi-* has become *či* 'you' in Mongolian.

6. Chukchi-Kamchatkan: The pronouns of the 1st and 2nd persons sg. and pl. are as follows in Chukchi:

	Singular	Plural
1	*γə*-m	mu-*ri*
2	*γə*-t	tu-*ri*

7. Gilyak / Nivkh: The 1st pl. inclusive stem **ma-/*mə-* is preserved in the 1st pl. inclusive pronoun *me-r*, *mi-r* 'we' (note also 1st dual *me-ge*, *me-gi*); the 1st plural stem **na-/*nə-* is found in the 1st pl. exclusive pronoun *ńyŋ* 'we'; the 2nd sg. stem **t^hi-/*t^he-* is preserved in the 2nd sg. pronoun *či* 'you'. (The forms cited are from the Amur dialect [cf. Gruzdeva 1998:25—26].)
8. Eskimo-Aleut: The 1st sg. stem **mi-/*me-* is preserved in the West Greenlandic 1st sg. relative possessive suffix *-ma*, while the 2nd sg. stem **t^hi-/*t^he-* is preserved in the 2nd sg. absolutive possessive suffix *-(i)t*. The plural forms are *-ma* and *-tit* respectively.
9. Etruscan: The 1st sg. stem **mi-/*me-* is preserved in (nominative) *mi* 'I', (accusative) *mini* 'me'; the 2nd sg. stem may be preserved in the pronoun stem *θi*, but this is uncertain since the meaning of the Etruscan form is unknown — however, the 2nd sg. stem **t^hi-/*t^he-* is clearly reflected in the Etruscan verbal imperative endings *-ti*, *-θ*, *-θi*.
10. Sumerian: *ma(-e)*, *me-a*, *me-e* 'I' are Emesal forms; *-me* is a 1st pl. possessive suffix, 'our'; *-zu* is a 2nd sg. possessive suffix, 'your'.

B. DEMONSTRATIVE PRONOUN STEMS

Proto-Nostratic	Proto-IE	Proto-Kartv.	Proto-Afrasian	Proto-Uralic	Proto-Dravid.	Proto-Altaic	Sum.
**sa-/*sə-*	**so-*	**š- (*s_1-)*		**sä*			
**tʰa-/ *tʰə-* proximate	**tʰo-*		**ta-*	**ta, *tä*	**tă̄n-*	**tʰa- (*tʰe-)*	
**tʰu-/ *tʰo-* distant	**tʰo-*		**tu*	**to*			
**kʰa-/ *kʰə-*	**kʰe-, *kʰo-, *kʰi-*	**-k-*	**ka-*				
**dʸi-/ *dʸe-*	**-dʰe*		**dʸi-*	**tʸi-/ *tʸe-*			
**ʔi-/*ʔe-*	**ʔe-/*ʔo-; *ʔeʸ-/ *ʔoʸ-/*ʔi-*	**i-, *e-* distant		**e*	**ĭ-* prox.	**i-, *e-* prox.	
**ʔa-/*ʔə-*	**ʔe-/*ʔo-*	**a-, *e-* prox.			**ă̆-* distant	**a-* distant	
**na-/*nə-, *ni-/*ne-, *nu-/*no-*	**ne-/*no-*		**na-*	**na, *nä *no*			*ne-en, ne(-e)*

Notes:

1. Indo-European: The stem **dʸi-/*dʸe-* is only preserved as a suffixed particle **-dʰe*; the stem **ne-/*no-* has a derivative **ʔe-no-/*ʔo-no-*.
2. Altaic: The stem **tʰa-/*tʰə-* is used as the distant demonstrative in Altaic: Mongolian (nom. sg.) *tere* (< **te-r-e*) 'that', (nom. pl.) *tede* (< **te-d-e*) 'those'; Tungus (Solon) *tari* 'that'; Manchu *tere* 'that'.
3. Gilyak / Nivkh: The proximate stem **tʰa-/*tʰə-* is preserved in (proximate) *tydʹ* 'this (the nearest to the speaker, visible and available in the present situation)'; the stem **kʰa-/*kʰə-* is preserved in *kudʹ* 'that (absent in the present situation, formerly referred to in the previous discourse)'. (The forms cited are from the Amur dialect.)
4. Eskimo-Aleut: The stem **tʰa-/*tʰə-* is preserved in the Inuit (also called Inupiaq) prefix *ta-*, which may be added to any demonstrative form whose coreferent has already been focused.
5. Etruscan: The proximate stem **tʰa-/*tʰə-* is preserved in *ita*, *ta* 'this'; the stem **kʰa-/*kʰə-* is preserved in *eca* (archaic *ika*), *ca* 'this'.
6. Sumerian: The demonstrative stem **ʔi-/*ʔe-* is found in *e* 'hither, here'.

C. RELATIVE AND INTERROGATIVE STEMS

Proto-Nostratic	Proto-IE	Proto-Kartv.	Proto-Afrasian	Proto-Uralic	Proto-Dravid.	Proto-Altaic
**kʷʰi-/ *kʷʰe-* relative	**kʷʰe-/ *kʷʰo-/ *kʷʰi-*			**ki*, **ke*		**kʰa(y)-*
**kʷʰa-/ *kʷʰə-* interrog.	**kʷʰe-/ *kʷʰo-/ *kʷʰi-*		**kʷa-*	**ku*, **ko*		(**kʰa[y]-*)
**mi-/*me-* interrog.	**me-/ *mo-*	**mi-*, **min-*	**mi-*	**mi*		
**ma-/ *mə-* relative	**me-/ *mo-*	**ma-*	**ma*	(**mi*)		
**ʔay-*, **ʔya-* relative & interrog.	**ʔyo-*		**ʔay(y)-*	**yo*	**yā-*	**yā-*

Notes:

1. Kartvelian: The relative/interrogative stem **ʔya-* is found in Svan (interrogative) *jär* 'who?', (relative) *jerwāj* 'who', (indefinite) *jer* 'somebody, something'.
2. Uralic: The relative stem **yo* is Finno-Volgaic. It is found in: Finnish *jo-* in *joka* 'who, which', *joku* 'someone, anyone', *jos* 'when'; Lapp / Saami *juokkĕ* 'each, every'; Mordvin *ju-* in *juza toza* 'to and fro, back and forth'; Cheremis / Mari (Western) *juž*, (Eastern) *južə̑* 'someone, anyone'.
3. Altaic: The interrogative stem **mi-/*me-* is found in the Turkish interrogative particles *mi*, *mı*, *mu*, *mü* and in the Middle Mongolian suffixed interrogative particle *-mu*, *-mi*.
4. Chukchi-Kamchatkan: The interrogative stem **mi-/*me-* is preserved in *me-in* 'who?'.
5. Eskimo-Aleut: The interrogative stem **kʷʰa-/*kʷʰə-* is preserved in the Proto-Eskimo interrogative pronoun **ki(na)* 'who?' and in **qaŋa* 'when?', **qavcit* 'how many?', **qaku* 'when (in future)?'. The interrogative stem **mi-/*me-* is preserved in the Proto-Eskimo enclitic particle **mi* 'what about?'.
6. Sumerian: The interrogative stem **mi-/*me-* occurs in *me-na-àm* 'when?', *me-a* 'where?', *me-šè* 'where to?'.

CHAPTER TWO

A SURVEY OF THE NOSTRATIC LANGUAGES

2.1. INDO-EUROPEAN

The Indo-European (in German, *Indogermanisch* — occasionally translated as "Indo-Germanic" in older works) language family includes the following branches: Anatolian (Hittite-Luwian), Italic, Celtic, Germanic, Tocharian, Greek, Baltic, Slavic, Albanian, Armenian, and Indo-Iranian. There are also a number of poorly-attested Indo-European daughter languages such as Thracian, Phrygian, Venetic, Illyrian, Ligurian, and several others. Phrygian may be the ancestor of Armenian, but this is not absolutely certain. Indo-European languages cover all of Europe except for Basque (found in northern Spain and the southwestern corner of France), Turkish (found in the Balkans), and Uralic (Finnish, Estonian, Hungarian, and several others with fewer speakers), modern Iran, parts of Central Asia north of Iran, Afghanistan, and northern and central India. European colonization has also spread Indo-European languages to the New World, where they have mostly supplanted Native American languages, to Australia and New Zealand, and to large parts of Africa and Asia, where they are used as languages of administration and/or learning. The extinct Hittite and Luwian (along with Palaic, Hieroglyphic Luwian, Lycian, Lydian, Carian, and several other poorly-attested dialects and/or languages) were spoken in what is now Turkey, while the Tocharian dialects, which are also extinct, were spoken in what is now the Xīnjiāng (Sinkiang; formerly called Chinese Turkestan) Uighur Autonomous Region (Xīnjiāng Wéiwú'ěr Zìzhìqū) of the People's Republic of China (Zhōnghuá Rénmín Gònghéguó).

The Indo-European language family has been subjected to thorough study for the past two centuries, and there is broad agreement among scholars on essentials, which is not to say that all problems have been resolved or that there are still not controversial issues. Several languages have extremely old records and/or literatures, such as Hittite, whose earliest records go back to around 1800 BCE, though the majority of documents date from 1500 to 1200 BCE; Mycenaean Greek, whose earliest inscriptions date from 1300 BCE; Sanskrit, with the oldest part of the Rig-Veda (composed in an archaic dialect of Old Indic) probably going back as far as 1200 BCE; Avestan, the liturgical language of Zoroastrianism, whose most ancient scriptures date from about 600 BCE; Old Persian, which begins with the Achaemenid Records from about 500 to 400 BCE; and Italic, with the oldest Latin inscription dating from the sixth century BCE, and with the earliest Oscan-Umbrian records dating from about the fifth century BCE. Records do not begin to appear for the other Indo-European daughter languages until the middle to later half of the first millennium CE.

Two large dialect groups are often recognized, especially in older works: (A) the so-called "centum" languages and (B) the so-called "satəm" languages. This dialectal division is based upon the different treatment of the gutturals in each group. In the satəm languages, sibilants (*s* and *z*), palato-alveolar fricatives (*š* and *ž*), and affricates correspond to velars in the centum languages, while velars and affricates in the former group correspond to reflexes of earlier labiovelars in the latter group. There are other correspondences as well, found in a small number of examples, in which velars in the centum languages correspond to velars in the satəm languages. Though much attention has been devoted in the literature to this division, its significance is greatly overrated.

Morphologically, Proto-Indo-European was a highly inflected language — except for particles, conjunctions, and certain quasi-adverbial forms, all words were inflected. The basic structure of inflected words was as follows: root + suffix (one or more) + inflectional ending. A notable morphophonemic characteristic was the extensive use of a system of vocalic alternations ("Ablaut" in German) as a means to mark morphological distinctions. Verbs were strongly differentiated from nouns. For nouns and adjectives, three genders, three numbers, and as many as eight cases have been reconstructed (mainly on the basis of what is found in Classical Sanskrit), though it is doubtful that all of these features were ancient — it is indeed possible to discern several chronological layers of development. The traditional reconstruction of the Proto-Indo-European verbal system sets up two voices, four moods, and as many as six tenses. Syntactically, Proto-Indo-European seems to have had many of the characteristics of an SOV language, though there must, no doubt, have been a great deal of flexibility in basic word order patterning. Proto-Indo-European morphology is discussed at length in Chapter 19 of this book, while earlier developments are discussed in Chapter 20.

It is generally agreed that the homeland of the Indo-Europeans is to be located to the north of and between the Black and Caspian Seas (cf. Anthony 2007). Alternative proposals are far less convincing. See Chapter 13 for more information about homelands.

The subgrouping of the Indo-European daughter languages has long been controversial. Though Sturtevant (following a suggestion by Emil Forrer) attempted to show that the Anatolian languages were the first to split off from the remainder of the Indo-European speech community, up until recently, most Indo-Europeanists did not follow him on this (a notable exception being Warren Cowgill). Sturtevant renamed the parent language "Indo-Hittite" to reflect this early split. The question about whether Baltic and Slavic are two independent branches or whether they are descended from a common Balto-Slavic is still contentious, as is the question of Italo-Celtic unity. In 1998, the problem of subgrouping was addressed by Donald Ringe and a group of linguists from the University of Pennsylvania. By using a computational cladistic model, they arrived at the following conclusions (Ringe—Warnow—Taylor—Michailov—Levison 1998:406—407):

> The important features of this tree can be summarized as follows. The Indo-Hittite hypothesis, according to which Anatolian is one first-order subgroup of

> the IE family and *all other branches together* are the other first-order subgroup is supported — but by only one character, the presence of a thematic aorist in the verb system... The satem core emerges as an extremely robust subgoup, always with the traditional internal structure (which is not surprising). More interestingly, there is always a subgroup including Greek and Armenian, as has been suspected in the past… Most interesting of all, Italo-Celtic emerges as a robust subgroup, as suggested by Jasanoff 1994.

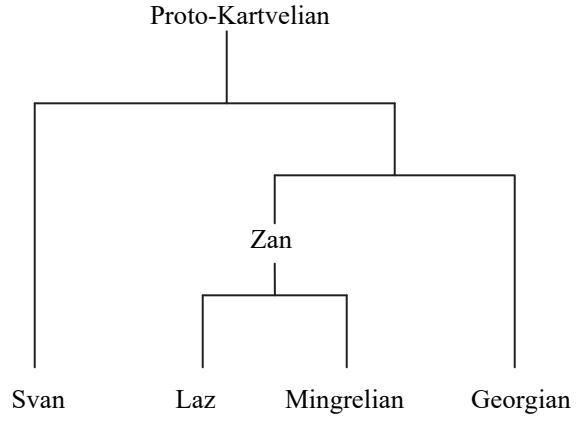
They further note that Tocharian also split off from the rest of the speech community at a very early date — it was the next branch to break away after Anatolian. Finally, they conclude that Germanic was originally part of the dialect continuum that included Balto-Slavic but that it later was in contact with and shared several common developments with Pre-Proto-Celtic and Pre-Proto-Italic.

The conclusions reached by Ringe and his colleagues are both sober and persuasive. Consequently, it is their views on the subgrouping of the Indo-European daughter languages that are followed in this book.

2.2. KARTVELIAN

Kartvelian (also referred to as South Caucasian), which is one of the three indigenous language families of the Caucasus Mountains, includes the following languages: Georgian, Mingrelian, Laz, and Svan. These languages fall into two main groupings, namely, Svan, on the one hand, and Georgian, Laz, and Mingrelian, on the other. Laz and Mingrelian, in turn, form the Zan subbranch. Svan preserves many archaic features. Except for Laz, which is spoken in Turkey, and the Ingilouri dialect of Georgian, which is spoken in Azerbaijan, the Kartvelian languages are spoken in the westernmost parts of the Caucasus Mountains within the borders of the Republic of Georgia (საქართველო).

The Kartvelian family tree may be represented as follows (cf. Tuite 1997:4; Schmidt 1962:13; Hewitt 1995:2; Gamkrelidze—Mačavariani 1982:20; Fähnrich—Sardshweladse 1995:5; Fähnrich 2007:5; Klimov 1969:46):



Georgian, which has its own distinctive alphabet, has a literary tradition going back 1500 years, the earliest text being a translation of the Bible dating from the 5th century CE, only fragments of which still exist. The early literature was exclusively religious, and it was only with the so-called "Golden Age" (12th century CE) that secular literature began to appear. There are a number of Georgian dialects, which differ not only in vocabulary and phonology but also in morphology and syntax.

A notable feature of Kartvelian phonology is the existence of complex consonant clusters — Georgian, for example, tolerates 740 initial clusters, which can have upwards of six members (Fähnrich 1993:20 lists eight), and 244 final clusters. In Svan, on the other hand, initial consonant clusters are far less complex than in Georgian, while final clusters can be far more complex. Old Georgian had both voiceless and glottalized uvular stops, but only the glottalized member is retained in Modern Georgian. Both are still found in Svan. Unlike Georgian, Svan does not distinguish /v/ and /w/ as distinct phonemes — it only has /w/.

Morphologically, the Kartvelian languages are all highly inflected; Georgian, for example, has six basic grammatical cases as well as eleven secondary cases. A notable characteristic of noun declension is the distinction of ergative and absolutive cases; the ergative case is used to mark the subject of transitive verbs, while the absolutive case is used to mark direct objects and the subject of intransitive verbs. It is the dative case, however, that is used to mark the subject of so-called "inverted verbs". There are several other departures from canonical ergative-type constructions, so much so in Mingrelian, for instance, that this language no longer possesses any true ergative features. Adjectives normally precede the nouns they modify. Postpositions are the rule. Verb morphology is particularly complicated — for example, Tuite (2004:978—981) lists thirteen distinctive functional elements that may be arrayed around a given verb root in Early Georgian, though they may not all appear simultaneously (Fähnrich 1994:78 lists twenty-three elements, including the root); the overall scheme is as follows:

1. Preverb with more or less predictable directional meaning
2. Preverb *mo-* ('hither')
3. Preverbial clitic
4. Morphological object prefix
5. Morphological subject prefix
6. Character or version vowel (German *Charaktervokal*)

   ROOT

7. Passive/inchoative or causative suffix
8. Plural absolutive suffix
9. Series marker (or "present/future stem formant")
10. Imperfect stem suffix
11. Tense/mood vowel
12. Person/number suffix
13. Postposed clitics

Syntactically, the predominant word order is SOV, though SVO is not uncommon.

2.3. AFRASIAN

Afrasian (also called Afroasiatic, Hamito-Semitic, Semito-Hamitic, Erythraic, and Lisramic) includes the following branches: Semitic, Egyptian, (Libyco-)Berber, Cushitic, Omotic, Chadic, and Ongota (for an attempt at subgrouping, see Chapter 7, §7.15, of this book). Except for Semitic, all of the Afrasian languages are found in northern and eastern Africa. In ancient times, Semitic was primarily located in the Near East, but Muslim conquests beginning in the 7th century CE have spread a single Semitic language, namely, Arabic, across the greater part of northern Africa, where it has totally replaced Egyptian (Coptic) as a spoken language and has greatly restricted, but has not totally supplanted Berber, which is still spoken across northern Africa. Though no longer spoken, Coptic is still used as the liturgical language of the Christian Coptic Church in Egypt. It is estimated that there are at least 375 languages in the family, including several important extinct languages.

The following chronology may be established for the branching off of the various branches of Afrasian (cf. Ehret 1995:483—490): Omotic, which appears to contain many distinctive features, must have been the first branch to split from the rest of the Afrasian speech community. The next split was between Cushitic on the one hand and Chadic, Egyptian, Berber, and Semitic on the other. Finally, Chadic split off, followed by Egyptian and Berber (cf. Blažek to appear for details). Within Semitic, Akkadian is the most archaic language as a whole, though Arabic preserves the original phonological structure better than any of the other Semitic languages. Tuareg is usually viewed as the most conservative Berber language, as are Beja (also called Beḍawye) and Saho-Afar within Cushitic.

The study of Afrasian as a whole is still not far advanced. Several branches, such as Semitic and Egyptian, for example, have written records going back many millennia and have been scientifically investigated rather thoroughly, while other Afrasian languages are scarcely even known. Egyptian, whose earliest inscriptions date from about 3400 BCE, and Akkadian, whose earliest inscription dates from the reign of King Lugalzagesi of Uruk (roughly 2352 to 2327 BCE), were the languages of great civilizations of antiquity, while Hebrew and Arabic are the liturgical languages of Judaism and Islam respectively. The Semitic languages exhibit great internal consistency as a group, with fairly straightforward correspondences in morphology, with close resemblance in their phonological systems, and with a large common vocabulary. In contrast, the internal divisions in the other branches, except for Egyptian, of course, which is a single language, are far more pronounced.

Proto-Afrasian was most likely highly inflected. It is simply not possible, however, given the present level of knowledge, to reconstruct the morphological structure of the parent language in detail, though some common features (such as the distinction of grammatical gender, the existence of two verbal conjugation systems, at least one of which, namely, the prefix conjugation, probably goes back to Proto-Afrasian, and a common set of pronominal stems) have been noted.

The Afrasian daughter languages are extremely diverse typologically. Some have complex phonological systems, including tones, while others do not. Some

have intricate inflectional systems, while others do not. Syntactically, the classical Semitic languages, Egyptian, and the Berber languages are VSO, the majority of the Cushitic languages are SOV, and most Chadic languages are SVO. For more information, cf. especially Frajzyngier—Shay (eds.) 2012 and D. Cohen (ed.) 1988.

2.4. URALIC-YUKAGHIR

As the name implies, Uralic-Yukaghir has two divisions, namely, Uralic and Yukaghir. Yukaghir consists of a single branch, while Uralic is divided into Finno-Ugrian (also called Finno-Ugric) and Samoyed. There are about 30 Uralic languages. The internal subgrouping of the Uralic languages is still not fully settled. Finno-Ugrian is thought to have become separated from Samoyed some time between 4,000 to 2,000 BCE. Yukaghir is located in northeastern Siberia, while Uralic languages are spread across northern Eurasia, from Scandinavia and central Europe in the west to north-central Siberia east of the Ural Mountains in the east.

Hungarian is the first Uralic language for which there are written records. Though the first printed text did not appear until 1527, Hungarian words are cited as early as the 9th and 10th centuries CE in Arabic and Byzantine documents. Finnish literature did not begin until 1548, with a translation of the Bible. An Estonian translation of the Bible first appeared in 1632. Yukaghir has no written literature.

Morphologically, the Uralic languages are predominantly agglutinating, though many of the modern languages, especially Estonian, which has innovated considerably, have deviated from the original type. Proto-Uralic nominal inflection had at least three numbers (singular, dual, and plural), two grammatical cases (accusative and genitive), and three local cases (dative, locative, and ablative). Verb morphology distinguished two conjugational types, namely, subjective and objective. A large number of suffixes existed, each with its own distinctive morphological function. The original syntactic structure seems to have been SOV, and this is fairly well preserved in the modern Samoyed and Ob-Ugric languages (Ostyak [Xanty] and Vogul [Mansi]) and Cheremis (Mari). The basic word order in the other languages is SVO, though, as a general rule, word order in all of the Uralic languages is rather flexible. Hungarian stands apart, word order being determined here more by topic-comment considerations than in the other Uralic languages, so that neither SOV nor SVO can be said to be dominant.

Yukaghir is also basically agglutinating, though a certain amount of fusion has taken place in the verb. There are few prefixes but numerous suffixes. Postpositions are the rule. Syntactically, the basic word order is SOV.

2.5. ELAMO-DRAVIDIAN

Dravidian has four branches: South Dravidian, South-Central Dravidian, Central Dravidian, and North Dravidian. Though the vast majority of Dravidian languages

are concentrated in southern India, there are also pockets of Dravidian in northern India, in Pakistan, in Nepal, in northern and eastern Sri Lanka, and on the Maldive Islands. At least 25 Dravidian languages are spoken. There is still uncertainty over the subgrouping of several languages. Elamite, which is now extinct, was located primarily in southwestern Iran in the vicinity of the Zagros Mountains as well as the adjacent plains of Khuzistan and to the south along the coast of the Persian Gulf. There is good reason to believe that Elamite once occupied all or nearly all of the Iranian plateau. The inscriptions of the Indus Valley (Harappan) Civilization may have been written in an early Dravidian language (cf. Bonta 2010 and 2015; Fairservis 1992:14—23; Parpola 1994; but see Zide—Zvelebil [eds.] 1976 for a critical assessment of attempts to decipher the Indus Valley script), though other possibilities cannot be entirely ruled out (cf. Witzel 1999; Farmer—Sproat—Witzel 2004).

The earliest Elamite text is the "Treaty of *Narām-Sin*", which dates from before 2200 BCE. After that, only cuneiform texts composed in a slightly deviant form of Akkadian are found until around 1300 BCE, when Elamite cuneiform texts begin to appear. The literature of the Dravidian languages, especially Tamil, is enormous. In addition to Tamil, Malayalam, Kannaḍa, and Telugu are fully-developed literary languages, while the remaining Dravidian languages have extensive oral traditions. The oldest Tamil literature probably dates from around the 2nd or 3rd centuries CE.

Morphologically, the Dravidian languages are agglutinating. The basic root type was monosyllabic, though there is some indication that an extremely small number of bisyllabic roots may have to be reconstructed at the Proto-Dravidian level as well. This is, however, by no means certain, and it is best at present to regard Proto-Dravidian roots as exclusively monosyllabic. Inflectional categorization was achieved by means of suffixes added directly to the lexical roots or to the lexical roots extended by means of derivational suffixes. Prefixes were not used. Any vowel, long or short, could appear in a root, but only *a*, *i*, or *u* could appear in a suffix. Two basic parts of speech were differentiated in Proto-Dravidian: (A) nominals, which included nouns and adjectives, and (B) verbs. Nouns were inflected for case, person, number, and gender. Eight cases (nominative, accusative, sociative, dative, genitive, instrumental, locative, and ablative), two numbers (singular and plural), and two genders (animate and inanimate) are assumed to have existed in Proto-Dravidian. There were separate first person plural inclusive and exclusive pronouns. Verbs were inflected for tense and person. There were two tenses (past and non-past) and two moods (modal and indicative). Indeclinables existed as a separate stem type distinct from nouns and verbs. Syntactically, the basic word order was SOV.

Elamite was also agglutinating. Three basic parts of speech were differentiated: (A) verbs, (B) nominals, and (C) indeclinables. The basic verbal stem form was (C)VC(V). Grammatical categorization was achieved by means of suffixation. In the nominal stems, case relationships were mostly indicated by the use of postpositions. Verb morphology was extremely simple. Word order structure was SOV. Cf. Grillot-Susini 1987; Hinz—Koch 1987; Khačikjan 1998; Paper 1955; McAlpin 1981; Reiner 1969; Stolper 2004.

2.6. ALTAIC

Altaic has at least three branches: Mongolian, (Manchu-)Tungus, and (Chuvash-) Turkic. Mongolian languages are spoken in Mongolia proper, in northern China in the so-called "Inner Mongolian Autonomous Region", in eastern Siberia in areas bordering on Mongolia, (Kalmyk) in Russia on the northwestern shores of the Caspian Sea, and (Moghol) in Afghanistan; (Manchu-)Tungus languages are spoken in eastern Siberia and (Manchu) in northeastern China in what was formerly known as Manchuria, but which is now divided between the provinces of Hēilóngjiāng, Jílín, and Liáoníng and the Inner Mongolia Autonomous Region (Nèi Měngǔ Zìzhìqū) and is populated mostly by ethnic Chinese (Hàn); and (Chuvash-) Turkic languages are spoken in a large, discontinuous band, stretching from Turkey in the west, across Central Asia and western China in the middle, and on to northeastern Siberia in the east. Some specialists consider Korean and Japanese-Ryukyuan (Japonic) to be related to the above languages. The term "Transeurasian" has recently been coined to take into account Korean and Japanese-Ryukyuan.

The oldest Turkic texts are the Orkhon inscriptions of the Kül-Tegin stele, written in a type of runic and dating from 735 CE. The earliest Mongolian inscription is only five lines long and mentions the nephew of the warrior-ruler Genghis Khan (Chinggis Qagan) (1162—1227 CE). The longest early literary work in Mongolian is *The Secret History of the Mongols* (*Mongγol-un niγuča tobčaγan*), an imperial chronicle written in Uighur script and thought to date from around 1240 CE. Few documents in Mongolian have survived from the period between the composition of that chronicle and the 17th century. Beginning with the 17th century, however, a rich Buddhist and historical literature began to appear. The language of that literature is known as Written Mongolian. There is an extensive literature in Manchu, but most of it is of relatively late origin and consists mainly of translations from Chinese sources.

The phonological systems of the Altaic languages are comparatively uncomplicated. Vowel harmony is a common phonological characteristic, though in the (Chuvash-)Turkic and Mongolian branches, it is based on a front ~ back contrast, while in the (Manchu-)Tungus branch, it is based on a high ~ low contrast. It is difficult to reconstruct the common Altaic morphological system in detail since there are deep differences among the descendant languages (the resemblances are more observable in vocabulary and syntax), though there are indeed a few common morphological elements, and all of the Altaic languages belong to the same type. Morphologically, the Altaic languages are typically agglutinating in structure. Though all Altaic languages make extensive use of suffixes, only a few of them are common to all three branches, one notable common feature here being the use of possessive suffixes. Nouns and verbs are clearly differentiated, though not as sharply as in Indo-European. There is a common stock of pronominal stems, and all Altaic languages use postpositions. Syntactically, the original structure was SOV, and this is well preserved in the modern languages, especially the Turkic languages, which are fairly strict in this regard, while more flexibility is found in the Mongolian and (Manchu-)Tungus languages.

2.7. CHUKCHI-KAMCHATKAN

The Chukchi-Kamchatkan family includes the following languages: Chukchi, Koryak, Kerek, Alyutor, and Kamchadal (also called Itelmen or Itelmic). Koryak, Kerek, and Alyutor are extremely close as a group, and these, in turn, are close to Chukchi. Kamchadal, which is now on the verge of extinction, stands apart from the others. The Chukchi-Kamchatkan languages are found in the extreme northeast corner of Siberia in the Chukotka and Kamchatka peninsulas. Though written languages were developed for Chukchi, Koryak, and Kamchadal in the 1930's, only Chukchi is still being used in publications and education.

Chukchi consonantism is fairly simple, there being only 14 distinct consonant phonemes, while that of Koryak is more complex than Chukchi, and that of Kamchadal is even more complex than either Chukchi or Koryak, containing both plain and glottalized stops, voiced and voiceless fricatives, and three lateral phonemes. A notable characteristic of Chukchi phonology is a system of vowel harmony based on a height contrast. In this system, vowels are classified as either "dominant" (*e*, *a*, *o*) or "recessive" (*i*, *e*, *u*) — note that the vowel *e* appears in both series. The presence of a dominant vowel in any morpheme in a word conditions the change of any recessive vowels in the word to their corresponding dominant counterparts. A similar system is partially preserved in Koryak.

The Chukchi-Kamchatkan languages are agglutinating. In Chukchi, however, some fusion has occurred, particularly in the verb. Chukchi nouns distinguish singular from plural. There are relatively few cases. Typical of the Chukotian branch is case marking of subjects and direct objects on the basis of an ergative-absolutive system (cf. Fortescue 2005:426). Chukchi and Koryak also exhibit a certain degree of incorporation, though it is not as extensively used as in Eskimo-Aleut. Verbs clearly distinguish between transitive and intransitive, with the ergative being used in conjunction with transitive verbs. Chukchi employs postpositions exclusively. Chukchi word order is rather free, with OV being slightly more predominant than VO.

2.8. GILYAK

Gilyak (also called Nivkh) is usually considered to be a single language, but the two main dialects, namely, the Amur dialect, on the one hand, and the Sakhalin (or Eastern) dialect, on the other, are not mutually intelligible. Of the two, the Sakhalin dialect is more archaic. The Gilyaks are found on the lower reaches of the Amur River and on Sakhalin Island. Though a written language was developed for the Amur dialect in the 1930's, next to nothing has appeared in it.

Gilyak tolerates highly complex consonant clusters. Furthermore, initial consonants undergo various alternations, which are conditioned both by the final segment of the preceding word and by syntactical considerations. In contrast, the vowel system is fairly simple.

Gilyak morphology is typologically similar to that found in the Altaic languages. Noun morphology is uncomplicated. Only a few cases are distinguished, including several basic spatial cases. Singular and plural are also distinguished. A system of numeral classifiers has been developed. In the pronouns, there are separate forms for first person dual and plural, while the first person plural, in turn, has a distinction between inclusive (*mer*) and exclusive (*ńəŋ*). Verb morphology is also simple, though one notable feature worth mentioning is the wide range of non-finite gerunds that can occur. Gilyak possesses postpositions but no prepositions. Basic word order structure is SOV.

2.9. ESKIMO-ALEUT

As the name implies, Eskimo-Aleut has two branches: Eskimo and Aleut. The Aleut dialects are mutually intelligible. However, this is not the case with the Eskimo dialects. Two main Eskimo dialect groups are distinguished, namely, Yupik and Inuit (also called Inupiaq). Yupik speakers are concentrated in southwestern Alaska, beginning at Norton Sound and extending southward along the western and southern coasts and inland. An extremely small enclave of Yupik speakers is found in northeastern Siberia as well. Inuit speakers are found north of Norton Sound all the way to the northern coast of Alaska and extending eastward across all of the northernmost parts of Canada and on into Greenland. Aleut is spoken on the Aleutian Islands and the Commander Islands.

The Proto-Eskimo vowel system was relatively simple (Proto-Eskimo had only four vowels: **i*, **a*, **u*, **ə* — phonemic length probably did not exist), while the consonant system resembled that of Proto-Uralic. The phonological systems found in the Eskimo dialects are far more complex than that of Proto-Eskimo. In contrast, Aleut phonology is less complicated. Nouns differentiate between singular, dual, and plural. The case system is reminiscent of that found in Chukchi-Kamchatkan, though it differs by using suffixes to indicate the plural. The verb makes no tense distinctions but has four moods and separate transitive and intransitive conjugations. The absolutive case is used as the subject of intransitive verbs and as the direct object of transitive verbs, while a different case is used as the subject of transitive verbs. Conjunctions and other particles are absent in most Eskimo dialects. A notable characteristic is that incorporation has been developed to such an extent that whole phrases may be expressed in a single word.

2.10. ETRUSCAN

Etruscan was spoken in central and northern Italy. Its earliest texts date from the 7th century BCE, and it probably ceased to be a spoken language around the first half of the first century CE, being replaced by Latin. It was written in a special alphabet derived from Greek. There are about 13,000 Etruscan inscriptions currently known, most of which are found on tombs and sarcophagi or on artifacts. These inscriptions

are extremely short, repetitive, and formulaic in nature. A few longer texts also exist, such as the Pyrgi quasi-bilingual (Etruscan and Phoenician) discovered in 1964. Unfortunately, no literary texts have survived. Though there still remain problems, the majority of what has survived can be read and understood. Several developmental stages and regional variants can be observed in the texts.

Etruscan is now known to be related to the poorly-attested Lemnian (spoken on the island of Lemnos) and to Raetic (spoken in northeastern Italy in present-day Tyrol). Together, they form the Tyrrhenian language family.

The Etruscan phonological system was composed of plain voiceless stops, voiceless aspirates, and fricatives, as well as two nasals (*m* and *n*), two liquids (*l* and *r*), and *h*. There were no voiced stops. There were only four vowels (*a*, *e*, *i*, *u*).

Etruscan was an inflectional language. Though there probably was no grammatical gender, special suffixes were used to indicate females. Etruscan nouns and adjectives distinguished several cases as well as two numbers (singular and plural). Verb morphology is not as well known due to the nature of the material that has survived.

2.11. SUMERIAN

Sumerian, which is now extinct, was spoken in southern Iraq, extending from around Babylon in its northernmost limits to the tip of the Persian Gulf in the south. From the time of the earliest texts, several dialects can be distinguished — the two most important dialects are called *eme-ĝir*$_{17}$ and *eme-sal* (*eme* means 'speech, language') by the Sumerians themselves. Moreover, during the three thousand or so years in which Sumerian was recorded, several distinct stages of development can be discerned — Old Sumerian, Neo-Sumerian, Old Babylonian Sumerian, etc. As noted in the previous chapter, Sumerian is not a Nostratic daughter language but is distantly related to Nostratic.

The earliest Sumerian inscriptions date from around 3200 BCE, though the oldest intelligible literary texts date from about 2600 BCE, and the language was probably still spoken as late as the 3rd century BCE. The Sumerian writing system was based exclusively on the cuneiform syllabary, which exhibits several marked stages of development over the course of Sumerian literary history.

Though the Sumerian phonological system was simple, there are still many uncertainties about underlying phonemic distinctions. For example, the traditional transcription shows a voiced ~ voiceless contrast in the stops, but this may well have been a voiceless unaspirated ~ voiceless aspirated contrast instead. There is still not, even after more than a century of intensive study, widespread agreement among experts in the field on many fundamental questions of Sumerian grammar. Nevertheless, the overall structure is reasonably clear. Morphologically, Sumerian was an agglutinating language. Three word classes were distinguished: (A) nouns, (B) verbs, and (C) adjectives. Though grammatical gender in the strictest sense did not exist, nouns fell into two classes, namely, animate and inanimate, which were only differentiated in 3rd person actor verbal and possessive pronoun affixes and in

the relative pronoun. Ten cases and two numbers (singular and plural) were distinguished. The plural was indicated either by means of the suffix *-ene*, which was used only with animate nouns, or by reduplication. In later texts, the plural could also be indicated by the form *hi-a*, which was used with inanimate nouns and which was originally an independent word meaning 'mixed, various, unspecified', or by *-me-eš*, which was properly the enclitic copula with plural suffix. Sumerian differentiated between ergative and absolutive in nouns. In pronouns, however, the patterning was that of a nominative-accusative system. Sumerian verbs were formed by adding various prefixes and/or affixes directly to the verbal root. Verbal constructions fell into one of two categories, namely, finite forms or non-finite forms. Finite verbal stems distinguished three conjugational types: (A) the intransitive conjugation, (B) the transitive *hamṭu* conjugation, and (C) the transitive *marû* conjugation. Intransitive forms were noted by means of pronominal suffixes, while transitive forms were noted by means of either prefixes, suffixes, or both. The basic word order structure was SOV.

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References:

General: Brown (ed.) 2005; Brown—Ogilvie (eds.) 2009; Collis (ed.) 1990; Comrie (ed.) 1981; Comrie (ed.) 1987; Fortescue 1998; Gray 1939:295—418; Gzella (ed.) 2012; Joseph—Salmons (eds.) 1998; Kaye (ed.) 1997 and 2007; Lamb—Mitchell (eds.) 1991; Meillet—Cohen (eds.) 1952; Pereltsvaig 2012; Ruhlen 1987; Woodard (ed.) 2004, 2008a, 2008b, 2008c, and 2008d.

Indo-European: Bader (ed.) 1994; Baldi 1983; Fortson 2010; Hirt 1905—1907; Lockwood 1970; Mallory 1989; Mallory—Adams 2006; Mallory—Adams (eds.) 1997; Ramat—Ramat (eds.) 1998; Sergent 1995; Villar 1991b and 1996.

Kartvelian: Fähnrich 1994; Hewitt (ed.) 1989; Klimov 1969:35—46; Tuite 2004.

Afrasian: Bergsträsser 1928 and 1983; Brockelmann 1908—1913; D. Cohen (ed.) 1988; Diakonoff 1965 and 1988; Frajzyngier—Shay (eds.) 2012; Hetzron (ed.) 1997; Garbini 1972; Lipiński 1997 and 2001; Rubin 2010; Weninger (ed.) 2011.

Uralic-Yukaghir: Abondolo (ed.) 1998; Collinder 1957 and 1965; Comrie (ed.) 1981:92—141; Décsy 1965; Hajdú 1975; Nikolaeva 2006; Sinor (ed.) 1988.

Elamo-Dravidian: Caldwell 1913; Krishnamurti 2001 and 2003; Steever (ed.) 1998; Zvelebil 1990; McAlpin 1981; Grillot-Susini 1987; Khačikjan 1998; Reiner 1969.

Altaic: Comrie (ed.) 1981:39—91; A. Dybo 2016; Fuchs et alii 1968; Gabain et alii 1982; Janhunen (ed.) 2003; Johanson—Csató (eds.) 1998; Menges 1968b and 1996; Poppe 1965; Poppe et alii (eds.) 1964; Robbeets 2005; Róna-Tas 1991.

Chukchi-Kamchatkan: Bogoras 1922; Comrie (ed.) 1981:240—252; M. Dunn 1999.

Gilyak / Nivkh: Comrie (ed.) 1981:266—272; Gruzdeva 1998.

Eskimo-Aleut: Collis (ed.) 1990; Comrie (ed.) 1981:252—258; Fortescue 1994.

Etruscan: Barker—Rasmussen 1998; Bonfante—Bonfante 1983 and 2002.

Sumerian: Crawford 1991; Edzard 2003; Falkenstein 1959; Hayes 1997a; Jagersma 2010; Michalowski 1992 and 2004; Rubio 2007a:79—85; Thomsen 1987.

CHAPTER THREE

A BRIEF HISTORY OF THE RECONSTRUCTION OF THE PROTO-INDO-EUROPEAN PHONOLOGICAL SYSTEM

3.1. AUGUST SCHLEICHER

Although the comparative-historical study of the Indo-European languages did not begin with August Schleicher, he was the first to attempt, in the first volume (1861 [4th edition 1876]) of his (in English translation) *Compendium of the Comparative Grammar of the Indo-European Languages*, to reconstruct the phonological system of the Indo-European parent language. Earlier scholars — especially Rasmus Rask and Jacob Grimm — had worked out the fundamental sound correspondences between the various daughter languages, and the need to reconstruct the phonological system of the parent language had been recognized as early as 1837 by Theodor Benfey, but no one prior to Schleicher had actually undertaken the task. Schleicher's reconstruction is as follows (1876:10 and 11):

	unaspirated		aspirated	spirants	nasals	*r*-sound
	voiceless	voiced	voiced	voiceless voiced	voiced	voiced
Guttural	k	g	gh			
Palatal				j		
Lingual						r
Dental	t	d	dh	s	n	
Bilabial	p	b	bh	v	m	

	Original Vowel	First Increment	Second Increment
a-grade	a	a + a = aa	a + aa = āa
i-grade	i	a + i = ai	a + ai = āi
u-grade	u	a + u = au	a + au = āu

3.2. THE NEOGRAMMARIAN PERIOD

Schleicher's reconstruction remained the accepted standard until the late 1870's, when a series of brilliant discoveries were made in rapid succession (cf. Delbrück 1974:55—61; Pedersen 1931:277—310):

1. First, there was the discovery of "The Law of Palatals" (*Das Palatalgesetz*) (cf. Collinge 1985:133—142; Pedersen 1931:277—282), which established the antiquity of the vowel systems found in Greek and Latin and recognized, for the first time, that the Sanskrit vowel system was an innovation in which earlier **ĕ*, **ŏ*, **ă* had merged into *ă*. This realization also led to the reconstruction of three distinct series of tectals (gutturals) in Proto-Indo-European: (1) palatals: **k̂*, **ĝ*, **ĝh*; (2) the so-called "pure velars": **q*, **g*, **gh*; and (3) labiovelars: **q^{u}*, **g^{u}*, **g^{u}h*.
2. The next major discovery was that Proto-Indo-European had syllabic nasals and liquids: **m̥*, **n̥*, **n̥̂*, **r̥*, **l̥*, **r̥* (cf. Pedersen 1931:283—285).
3. Following these discoveries, the system of vowel gradation (*Ablaut*) became clear, and the original patterning was worked out in precise detail (cf. Pedersen 1931:285—290; Fortson 2004:73—76 and 2010:79—83; Meillet 1964:153—168; Beekes 1995:164—167 and 2011:174—178; Hübschmann 1885:71—180; Brugmann 1904:138—150; Szemerényi 1990:86—97; Clackson 2007:71—75).
4. Finally, Verner's Law (cf. Collinge 1985:203—216; Pedersen 1931:282—283) explained several annoying exceptions to the expected developments of the earlier voiceless stops in Proto-Germanic. First, the voiceless stops became voiceless fricatives in Proto-Germanic: **p*, **t*, **k*, **k^{w}* > **f*, **θ*, **χ*, **χw*. Then, at a later date, these voiceless fricatives became the voiced fricatives **β*, **ð*, **γ*, **γw* respectively except (A) initially and (B), in some cases, medially between vowels. The problem was that both voiceless and voiced fricatives appeared medially between vowels, and the choice between voiceless fricatives, on the one hand, and voiced fricatives, on the other hand, appeared to be entirely random. What Verner figured out was that the patterning was tied to the original position of the accent — the voiceless fricatives appeared medially between vowels when the accent had originally fallen on the contiguous preceding syllable. If the accent had originally fallen on any other syllable, however, voiced fricatives appeared.

By the end of the nineteenth century, the phonological system reconstructed by the Neogrammarians was widely accepted as being a fairly accurate representation of what had existed in Proto-Indo-European. To this day, the Neogrammarian system, or slightly modified versions thereof, commands a great deal of respect and has many defenders.

The Neogrammarian reconstruction of the Proto-Indo-European phonological system, which was arrived at through strict adherence to the principle that sound laws admit no exceptions, was notable for its large inventory of stops and its extremely small inventory of fricatives. The stop system consists of a four-way contrast of (A) plain voiceless stops ~ (B) voiceless aspirated stops ~ (C) plain voiced stops ~ (D) voiced aspirated stops. This system is extremely close to the phonological system of Old Indic (cf., for example, Gonda 1966:9; Mayrhofer 1972:17). Actually, there were two competing versions of the Proto-Indo-European phonological system at this time: (A) the German system (cf. Brugmann 1904:52; Hirt 1921—1927.I:198—337, II:1—230), which was phonetically based, and (B)

the French system (cf. Meillet 1964:82—145), which was phonologically based (cf. Szemerényi 1972:122). It must be pointed out that, in spite of its wide acceptance, a small group of scholars has, from time to time, questioned the validity of the Neogrammarian reconstruction, at least in part (for a discussion of some of the opposing views, cf. Hopper 1977b:57—72 and Szemerényi 1972:122—136).

Brugmann's (1897:92—93, 1904:52, and 1905:54) reconstruction is as follows:

Monophthongs:	e	o	a	i	u	ə		
	ē	ō	ā	ī	ū			
Diphthongs:	e̯i̯	o̯i̯	a̯i̯	əi̯	e̯u̯	o̯u̯	a̯u̯	əu̯
	ēi̯	ōi̯	āi̯		ēu̯	ōu̯	āu̯	
Semivowels:		i̯	u̯	(j ?)				
Liquids and Nasals:			l	r	m	n	n̂	ɒ
Syllabic Liquids and Nasals:			l̥	r̥	m̥	n̥	n̥̂	ɒ̥
			l̥̄	r̥̄	m̥̄	n̥̄	n̥̂̄	ɒ̥̄
Occlusives:	p	ph	b	bh	(bilabial)			
	t	th	d	dh	(dental)			
	k̂	k̂h	ĝ	ĝh	(palatal)			
	q	qh	g	gh	(pure velar)			
	qᵘ	qᵘh	gᵘ	gᵘh	(labiovelar)			
Spirants:	s	sh	z	zh	þ	þh	ð	ðh

Brugmann reconstructed five short vowels and five long vowels plus a reduced vowel, the so-called "schwa indogermanicum" (also called "schwa primum"), written **ə*, which alternated with so-called "original" long vowels. A full set of diphthongs was posited as well. Finally, the system contained the semivowels **i̯* and **u̯*, a series of plain and aspirated spirants, several nasals, and the liquids **l* and **r*. The nasals and liquids were unique in their ability to function as syllabics or nonsyllabics, depending upon their environment. They were nonsyllabic (A) when between vowels or initially before vowels, (B) when preceded by a vowel and followed by a consonant, and (C) when preceded by a consonant and followed by a vowel. The syllabic forms arose in early Proto-Indo-European when the stress-conditioned loss of former contiguous vowels left them between two nonsyllabics.

It should be noted here that the Proto-Indo-European vowels were subject to various alternations that were partially correlated with the positioning of the accent within a word. These vowel alternations served to indicate different types of grammatical formations. The most common alternation was the interchange between the vowels **e* and **o* in a given syllable. There was also an alternation among lengthened-grade vowels, normal-grade vowels, and reduced-grade and/or

zero-grade vowels (for details, cf. Anttila 1969; Brugmann 1904:138—150; Fortson 2004:73—76 and 2010:79—83; Hirt 1900; Hübschmann 1885).

Hirt's reconstruction (1900; 1902:73 and 131; 1921—1927, vol. I:198—337 and vol. II) is close to that of Brugmann:

I. The Indo-European consonant system according to Hirt:

Place of Articulation	Tenues	Tenues Aspiratae	Mediae	Mediae Aspiratae	Voiceless Fricatives	Voiced Fricatives	Nasals
Labial	p	ph	b	bh	—	—	m
Dental	t	th	d	dh	þ (?) s	đ (?) z	n
Palatal	k̂	k̂h	ĝ	ĝh	—	ǰ (?)	n̂
Pure Velar	k	kh	g	gh	—	—	ʁ
Labialzed Velar	k^w	kh^w	g^w	gh^w	—	—	—
Also: r, l, j, w							

II. The Indo-European vowel system according to Hirt:

Monophthongs: e o a
ē ō ā

Diphthongs: ei oi ai eu ou au
ēi ōi āi ēu ōu āu

Reduced-grade: ь i u r̥ l̥ m̥ n̥ (ьj ьw ьr ьl ьm ьn)

Meillet's reconstruction differs from those of Brugmann and Hirt in several important respects. First, Meillet (1964:91—95) reconstructs only two guttural (tectal) series, namely, palatals and labiovelars — he does not recognize a separate pure velar series. Specifically, he notes that the cases in which velars in the centum languages correspond to velars in the satəm languages occur in certain specific environments: (A) before **a*; (B) before **r*; (C) after **s*; and (D) at the end of roots, especially after **u*. Meillet sums up his discussion of the gutturals by noting that the velars were simply preserved in certain positions and palatalized in others.

Brugmann posited a separate series of voiceless aspirates for Proto-Indo-European on the basis of an extremely small, and somewhat controversial, set of correspondences from Indo-Iranian, Armenian, and Greek. In the other daughter languages, the voiceless aspirates and plain voiceless stops have the same treatment,

except that **kh* appears to have became *x* in a small number of examples in Slavic — however, these examples are better explained as borrowings from Iranian rather than as due to regular developments in Slavic (cf. Carlton 1991:95). As early as 1891, in a paper read before the Société de Linguistique de Paris, the Swiss scholar Ferdinand de Saussure suggested that the voiceless aspirates might have had a secondary origin, arising from earlier clusters of plain voiceless stop plus a following "coefficient sonantique". This idea was taken up by Meillet (1964:90—91), who pointed out the great rarity of the voiceless aspirates, noting in particular that the dental voiceless aspirate **th* often appears to be the result of aspiration of a plain voiceless dental by a following **ə*: **t* + **ə* > **th*, at least in Sanskrit. Current thinking on the part of the overwhelming majority of linguists is that the series of voiceless aspirates (**ph*, **th*, **k̂h*, **qh*, **qᵘh*) reconstructed by Brugmann and other Neogrammarians for the Indo-European parent language should be removed, being secondarily derived in the individual daughter languages (cf. Bomhard—Kerns 1994:39 for references). The main opponent of this view was Oswald Szemerényi, who argued for the reinstatement of the voiceless aspirates and, consequently, for a return to the four-stop system (plain voiceless ~ voiceless aspirated ~ plain voiced ~ voiced aspirated) of the Neogrammarians. We will return to this problem later.

Especially noteworthy is Meillet's (1964:105—126) treatment of the resonants. Here, he considers **i* and **u* to be the syllabic allophones of **y* (Brugmann's **i̯*) and **w* (Brugmann's **u̯*) respectively and classes them with the resonants, thus: **i*/**y*, **u*/**w*, **m̥*/**m*, **n̥*/**n*, **r̥*/**r*, **l̥*/**l*, that is to say that he does not consider **i* and **u* to be independent phonemic entities. The diphthongs are analyzed by Meillet (1964:110—118) as clusters of (A) vowel plus nonsyllabic resonant and (B) nonsyllabic resonant plus vowel.

Meillet's (1964:82—145) reconstruction may be represented as follows:

Vowels:	e	o	a		
	ē	ō	ā		
Resonants:	i/y	u/w	m̥/m	n̥/n	r̥/r	l̥/l	ə
Occlusives:	p	ph	b	bh	(bilabial)
	t	th	d	dh	(dental)
	$k_ı$	$k_ıh$	$g_ı$	$g_ıh$	(palatal)
	k^w	k^wh	g^w	g^wh	(labiovelar)
Sibilant:	s				

3.3. THE TWENTIETH CENTURY TO 1970

In 1878, Ferdinand de Saussure attempted to show that so-called "original" long vowels were to be derived from earlier sequences of short vowel plus a following "coefficient sonantique". In 1927, Jerzy Kuryłowicz and Albert Cuny separately

demonstrated that reflexes of de Saussure's "coefficients sonantiques" were preserved in Hittite. On this basis, a series of consonantal phonemes, commonly called "laryngeals", was then posited for Proto-Indo-European. Kuryłowicz, in particular, set up four laryngeals, which he wrote $*\underset{\sim}{\text{ə}}_1$, $*\underset{\sim}{\text{ə}}_2$, $*\underset{\sim}{\text{ə}}_3$, $*\underset{\sim}{\text{ə}}_4$. The vast majority of scholars currently accept some form of this theory, though there is still no general agreement on the number of laryngeals to be reconstructed for Proto-Indo-European or on their probable phonetic values (for information about the Laryngeal Theory, cf. Bammesberger 1984; Jonsson 1978; Keiler 1970; Kellens 1990; Lindeman 1997; Sturtevant 1942; Winter [ed.] 1965; Vennemann [ed.] 1989). The following phonetic values may be assigned to the laryngeals (for details, cf. Chapter 4, §4.1):

$*\underset{\sim}{\text{ə}}_1$	=	Glottal stop /ʔ/
$*\underset{\sim}{\text{ə}}_2$	=	Voiceless and voiced multiply-articulated pharyngeal/laryngeal fricatives /ħ͡h/ and /ʕ͡ɦ/
$*\underset{\sim}{\text{ə}}_3$	=	Voiceless and voiced multiply-articulated pharyngeal/laryngeal fricatives /ħ͡h/ and /ʕ͡ɦ/
$*\underset{\sim}{\text{ə}}_4$	=	Voiceless glottal fricative /h/

With the reduction of the gutturals to two series, the removal of the traditional voiceless aspirates, the reanalysis of the diphthongs as clusters of vowel plus nonsyllabic resonant and nonsyllabic resonant plus vowel, and the addition of laryngeals, we arrive at the system of Lehmann (1952:99):

1. Obstruents:	p	t	k	k^w	
	b	d	g	g^w	
	b^h	d^h	g^h	g^{wh}	
		s			
2. Resonants:	m	n			
	w r	l y			
3. Vowels:	e	a	o	$_e$	
	i· e·	a·	o·	u·	
4. Laryngeals:	x	γ	h	ʔ	

Now, the removal of the traditional voiceless aspirates creates a problem from a typological point of view. Data collected from the study of a great number of the world's languages have failed to turn up any systems in which voiced aspirates are added to the pair plain voiceless stop ~ plain voiced stop unless there are also corresponding voiceless aspirated stops in the system (cf. Jakobson 1971[1957]: 528; Martinet 1970:115; Pericliev 2008). This is an important point, affecting the entire structure of the traditional reconstruction. In order to explain this imbalance, several scholars have sought typological parallels with systems such as those found, for example, in the Indonesian language Javanese. In these rare systems, there is a three-way contrast, sometimes described as (A) plain (unaspirated) voiceless ~ (B) voiced ~ (C) "voiced aspirated": /T/ ~ /D/ ~ /D^h/. However, this interpretation is

based upon a lack of understanding of the phonetics involved. Series (C) in such systems is, in reality, voiceless with breathy release — something like /tʱ/ — and not true "voiced aspirated" (cf. Maddieson 1984:207; Weiss 2009b:23). Regarding the so-called "voiced aspirates" of Bario Kelabit, Blust (2013:183) notes:

> Bario Kelabit has a second series of voiced obstruents *bʰ*, *dʰ*, *gʰ* that begin voiced and end voiceless, with variable voiceless onset to the following vowel, as in *təbʰuh* [tə́bpʰuh] 'sugarcane', *idʰuŋ* [ʔídtʰʊŋ] 'nose', or *ugʰəŋ* [ʔúgkʰəŋ] 'spin without wobbling, of a top'. These segments thus differ from the fully voiced murmured stops of Hindi or other Indo Aryan languages that are still sometimes called 'voiced aspirates'. Phonetically the Kelabit voiced aspirates occur only word-medially following a stressed vowel.

As we have seen from the preceding discussion, Lehmann's reconstruction is problematical from a typological point of view. However, from a purely structural point of view, it presents an accurate analysis of Proto-Indo-European phonological patterning.

The reconstructions of the Proto-Indo-European consonant system found in most of the standard handbooks are based upon Lehmann's system (cf. Adrados—Bernabé—Mendoza 2010.I:148; Clackson 2007:34; Clackson—Horrocks 2007:7; Fortson 2010:56; Kapović 2017b:13; Lejeune 1972:28; Mallory—Adams 1997:459; Meier-Brügger 2010:202; Meiser 2006:27; Melchert 1994a:46; Ringe 2006:6; Rix 1992:29; Schmitt-Brandt 1998:75—91; Shevelov 1964:26; Sihler 1995:135; Tichy 2006:23; Watkins 1998:34; Weiss 2009a:33; etc.):

	Labial	Dental	Palatal	Velar	Labiovelar
Voiceless	*p	*t	*$\hat{k}$	*k	*k^{w}
Voiced	*b	*d	*$\hat{g}$	*g	*g^{w}
Voiced aspirated	*bh	*dh	*$\hat{g}$h	*gh	*g^{w}h

Several scholars have proposed various solutions in an attempt to eliminate the problems caused by the removal of the traditional voiceless aspirates. For example, Jerzy Kuryłowicz (1964b:13) tried to show that the voiced aspirates were not phonemically voiced. However, this interpretation seems unlikely in view of the fact that the daughter languages are nearly unanimous in pointing to voicing in this series in the Indo-European parent language (for correspondences and examples, cf. Meillet 1964:86—88). The main exceptions are Tocharian and possibly Hittite (at least according to some scholars). In each case, however, it is known that the voicing contrast was eliminated and that the reflexes found in these daughter languages do not represent the original state. The Greek and Italic developments are a little more complicated: in these daughter languages, the traditional voiced aspirates were devoiced, thus becoming voiceless aspirates. Then, in Italic, the resulting voiceless aspirates became voiceless fricatives:

$$b^{h}, d^{h}, g^{h}, g^{wh} \quad > \quad p^{h}, t^{h}, k^{h}, k^{wh} \quad > \quad f, \theta, \chi, \chi w$$

According to Eduard Prokosch (1933:26—27 and 1939:39—41), on the other hand, the voiced aspirates of traditional grammar were really the voiceless fricatives *φ, *θ, *χ, *χw (= *bh, *dh, *gh, *g^wh respectively). This interpretation seems unlikely for two reasons: (A) as noted above, the daughter languages point to voicing in this series in Proto-Indo-European, and (B) the daughter languages point to stops as the original mode of articulation and not fricatives. This latter objection may also be raised against the theory — advocated by Alois Walde (1897:491) and Johann Knobloch (1965:163) — that the voiced aspirates may have been the voiced fricatives *β, *$\eth$, *γ, *γw (= *bh, *dh, *gh, *g^wh respectively).

Next, there is the theory put forth by Louis Hammerich (1967:839—849) that the voiced aspirates may have been emphatics. Hammerich does not define what he means by the term "emphatics" but implies that they are to be equated with the emphatics of Semitic grammar. Now, in Arabic, the emphatics have been described as either uvularized (cf. Catford 1977b:193) or pharyngealized (cf. Al-Ani 1970:44—58; Catford 1977b:193; Chomsky—Halle 1968:306). Lipiński (1997: 105) describes the pronunciation of the Arabic emphatics as follows:

> In Arabic, instead, the characteristic articulatory feature of all the emphatic phonemes is the contraction of the upper pharynx, accompanied by a velarization; the latter can be seen by means of a radioscopy which shows how the emphatic phonemes are articulated with a raising of the back part of the tongue in the region of the velum. This velarization gives them, and the surrounding vowels, a sombre *u*-quality that tends to spread over the whole word.

As in the Arabic example just cited, such sounds are always accompanied by backing of adjacent vowels wherever they occur (cf. Dolgopolsky 1977:1—13; Hyman 1975:49; Ladefoged 1971:63—64; Laver 1994:328) — in Arabic, this is called *tafḫīm* "emphasis spread" (cf. Ryding 2014:19; J. Watson 2002:268—286).

In Proto-Indo-European, all vowels were found in the neighborhood of the voiced aspirates, and there is no indication that any of these sounds had different allophones here than when contiguous with other sounds. Had the voiced aspirates been emphatics such as those found in Arabic, they would have caused backing of contiguous vowels, and this would be reflected in the daughter languages in some manner. However, this is not the case. If, on the other hand, the emphatics had been ejectives such as those found in the Modern South Arabian languages, the Semitic languages of Ethiopia, and several Eastern Neo-Aramaic dialects (such as, for instance, Urmian Nestorian Neo-Aramaic and Kurdistani Jewish Neo-Aramaic), the question arises as to how these sounds could have developed into the voiced aspirates needed to explain the developments in Indo-Iranian, Greek, Italic, and Armenian.

Oswald Szemerényi (1967:65—99) was one of the first to bring typological data to bear on the problem of reconstructing the Proto-Indo-European phonological system. Taking note of Jakobson's (1971[1957]:528) remark that:

> ... no language adds to the pair /*t*/ ~ /*d*/ a voiced aspirate /*d*^{h}/ without having its voiceless counterpart /*t*^{h}/...

Szemerényi reasoned that, since Proto-Indo-European had voiced aspirates, it must also have had voiceless aspirates (Elbourne 1998 makes the same point). Though on the surface this reasoning appears sound, it puts too much emphasis on the typological data and too little on the data from the Indo-European daughter languages. As mentioned above, there are very cogent reasons for removing the traditional voiceless aspirates from Proto-Indo-European, and these reasons are not easily dismissed. Szemerényi also tried to show that Proto-Indo-European had only one laryngeal, namely, the voiceless glottal fricative /h/. Szemerényi's (1967:96—97 and 1996:37—70, especially pp. 69—70) reconstruction is as follows:

	p	t	k′	k	k^w	
	p^h	t^h	k'^h	k^h	k^{wh}	
	b	d	g′	g	g^w	
	b^h	d^h	g'^h	g^h	g^{wh}	
			y	w		
		l	r	m	n	
			s	h		
	a	e	o	i	u	ə
	ā	ē	ō	ī	ū	
(also the sequences	ah	eh	oh	ih	uh)	

Szemerényi does not include diphthongs in his reconstruction since their "phonemic status is disputed".

Szemerényi's reconstruction is in fact typologically natural, and he defended it strongly right up through his last major work (cf. Szemerényi 1996:37—70). His system — as well as that of the Neogrammarians, it may be added — is merely a projection backward in time of the Old Indic phonological system (cf. Mayrhofer 1972:17—29; Gonda 1966:9—19). In certain dialects of "Disintegrating Indo-European" (specifically, in the early development of Pre-Indo-Iranian, Pre-Greek, and Pre-Italic), such a system no doubt existed in point of fact.

Next, there are the proposals put forth by Joseph Emonds (1972). According to Emonds, the plain voiced stops of traditional Proto-Indo-European are to be reinterpreted as plain lax voiceless stops, while the traditional plain voiceless stops are taken to have been tense and aspirated:

Lehmann					Emonds			
p	t	k	k^w	=	ph	th	kh	kh^w
b	d	g	g^w	=	p	t	k	k^w
b^h	d^h	g^h	g^{wh}	=	bh	dh	gh	gh^w

Emonds regards the voicing of the lax stops as common to a Central innovating area and the appearance of voiceless stops in Germanic, Armenian, and Hittite as relics.

Similar proposals were put forth by Toby D. Griffen (1988:162—189). According to Griffen, Proto-Indo-European had a three-member stop system, which he represents as (using the dentals for illustration) *[d], *[t], *[t^h] (media, tenuis, aspirata). While this system was maintained in Germanic with only minor changes, a series of sound-shifts in the other Indo-European daughter languages completely restructured the inherited system. Thus, Germanic emerges as the most conservative daughter language in its treatment of the Indo-European stop system.

There are other problems with the traditional reconstruction besides the typological difficulties caused by the removal of the voiceless aspirates. Another problem, noted in most of the standard handbooks (cf., for example, Adrados 1975.I:108; Burrow 1973:73; Krause 1968:116—117; Lehmann 1952:109; Meillet 1964:84 and 89), is the statistically low frequency of occurrence — perhaps total absence — of the traditional voiced bilabial stop **b*. We may cite Meillet's (1964: 89) comments on this matter:

> *b* is relatively rare; it does not occur in any important suffix nor in any ending; it is secondary in some of the words where it is found, thus, Skt. *píbāmi* 'I drink', OIr. *ibim* 'I drink', Lat. *bibō* (with initial *b* through assimilation) is an ancient reduplicated form in view of Skt. *pāhi* 'drink', Gk. πῖθι, OCS. *piti* 'to drink', Lat. *pōculum* 'cup'; ...other words are imitative, thus Gk. βάρβαρος, Lat. *balbus*, etc.; still others are limited to a few languages and give the impression of being recent borrowings.

The marginal status of **b* is difficult to understand from a typological viewpoint and is totally unexplainable within the traditional framework. This problem was investigated in 1951 by the Danish scholar Holger Pedersen. Pedersen noted that, in natural languages having a voicing contrast in stops, if there is a missing member in the bilabial series, it is /p/ that is missing and not /b/. This observation led Pedersen to suggest that the traditional plain voiced stops might originally have been plain voiceless stops, while the traditional plain voiceless stops might have been plain voiced stops:

Brugmann						Pedersen					
b	d	ĝ	g	g^u	=	Ø	t	k̂	k	k^w
p	t	k̂	q	q^u	=	b	d	ĝ	g	g^w

Later shifts would have changed the earlier plain voiced stops into the traditional plain voiceless stops and the earlier plain voiceless stops into the traditional plain voiced stops. In a footnote in his 1953 *BSL* article entitled "Remarques sur le consonantisme sémitique", André Martinet (1975[1953]:251—252, fn. 1) objected to this "musical chairs" rearrangement:

> Since there are extremely few examples of the Common Indo-European phoneme reconstructed "analogically" as **b*, it is tempting to diagnose a gap there as well, as the late Holger Pedersen did in *Die gemeinindoeuropäischen und die vorindoeuropäischen Verschlusslaute*, pp. 10-16. But, instead of assuming, as did Pedersen, the loss of a Pre-Indo-European **p* followed by a musical-chairs [rearrangement] of *mediae* and *tenues*, one should be able to see in the series **d*, **g*, **g*^{w} the result of evolution from an earlier series of glottalics, without bilabial representative.

Though hinted at as early as 1939 by Nikolaj Trubetzkoy, this appears to be the first time that anyone had explicitly proposed reinterpreting the plain voiced stops of traditional Proto-Indo-European as glottalics. Gamkrelidze devotes a whole paper (2001a) to discussing Martinet's important role in the development of the Glottalic Theory.

In the preceding discussion, only the more well-known counterproposals were mentioned, and only the briefest of explanations were given. More details could easily have been given. Insights gained from typological studies, for example, could have been used to strengthen the arguments: no phoneme stands alone; it is, rather, an integral part of the total system. Each and every phoneme is tied to the other phonemes in the system by discrete interrelationships — to disturb one phoneme is to disturb (at least potentially) the entire system. This is basically the message that Jakobson and Martinet were trying to bring home. All too often, this message is ignored. Moreover, the interrelationships are not only synchronic, they are diachronic as well.

3.4. THE GLOTTALIC THEORY

Discovery — perhaps "rediscovery" would be a better term since Martinet's insightful remarks first appeared in 1953 — of what has come to be known as the "Glottalic Theory" came from two separate sources, each working independently. On the one-hand, the British-born American Germanist Paul J. Hopper hit upon the notion that Proto-Indo-European may have had a series of glottalized stops while he was a student at the University of Texas and taking a course in Kabardian from Aert Kuipers. Hopper went on about other business after graduation, waiting five years before putting his ideas into writing. On the other hand, the Georgian Indo-Europeanist Thomas V. Gamkrelidze, a native speaker of a language containing glottalics (Georgian [ქართული ენა]), had been investigating the typological similarities between Proto-Kartvelian and Proto-Indo-European (cf. Gamkrelidze 1966 and 1967). It did not take Gamkrelidze long to realize the possibility that Proto-Indo-European might also have had glottalized stops. Gamkrelidze, in a joint article with the Russian Indo-Europeanist Vjačeslav V. Ivanov, was the first to make it into print (Gamkrelidze—Ivanov 1972). Hopper might have beat them into print had his paper on the subject not been rejected by the journal *Language*. He was then obliged to search for another journal willing to publish his views, which

finally happened in 1973. Then, in 1973, Gamkrelidze and Ivanov published a German language version of their 1972 paper.

Hopper (1973:141—166) proposed reinterpreting the plain voiced stops of traditional Proto-Indo-European — Lehmann's **b*, **d*, **g*, **g*^{w} — as glottalized stops (ejectives), that is, (**p'*), **t'*, **k'*, **k'*^{w} respectively, because the traditional plain voiced stops …

> show many of the typological characteristics of glottalized stops (ejectives), e.g. they are excluded from inflectional affixes, they may not cooccur with another in the same root, etc.

Hopper also reinterpreted the traditional voiced aspirates as murmured stops.

Gamkrelidze—Ivanov (1972:15—18 and 1973:150—156) also reinterpreted the traditional plain voiced stops as ejectives, but, unlike Hopper, they reinterpreted the traditional plain voiceless stops as voiceless aspirates. They made no changes to the traditional voiced aspirates. They pointed out, however, that the feature of aspiration is phonemically irrelevant in a system of this type. In a later article, Gamkrelidze (1976:403) gives the following reconstruction:

Lehmann				Gamkrelidze		
b	b^{h}	p	=	p'	bh/b	ph/p
d	d^{h}	t	=	t'	dh/d	th/t
g	g^{h}	k	=	k'	gh/g	kh/k
g^{w}	g^{wh}	k^{w}	=	k'$\underline{u}$	g$\underline{u}$h/g$\underline{u}$	k$\underline{u}$h/k$\underline{u}$

According to Gamkrelidze (1981:607), such a system exists in several modern Eastern Armenian dialects (however, this is challenged by Jahukyan 1990:7—8).

Many of the points discussed above by Gamkrelidze were also noted by Hopper, in particular the root structure constraint laws (cf. Hopper 1973:158—161). Hopper also discusses possible trajectories of the new system in various Indo-European daughter languages.

The Glottalic Model has several clear advantages over the traditional reconstruction of the Proto-Indo-European stop system:

1. The reinterpretation of the traditional plain voiced stops as glottalics (ejectives) makes it easy to account for the fact that the phoneme traditionally reconstructed as **b* was highly marked in the system, being characterized by an extremely low frequency of occurrence (if it even existed at all). Such a low frequency distribution is extremely uncharacteristic of the patterning of the voiced bilabial stop /b/ in natural languages having a voicing contrast in stops, but it is fully characteristic of the patterning of the bilabial ejective /p'/ (cf. Gamkrelidze 1981:605—606; Gamkrelidze—Ivanov 1995.I:9—12; Greenberg 1970:127; Hopper 1973:155).

2. Not only does the reinterpretation of the traditional voiced stops as ejectives easily account for the frequency distribution of these sounds, it also explains the fact that they were used only very infrequently in inflectional affixes and pronouns, since this type of patterning is characteristic of the way ejectives behave in natural languages having such sounds.
3. For the first time, the root structure constraint laws can be credibly explained. These constraints turn out to be a simple voicing agreement rule with the corollary that two glottalics cannot cooccur in a root. Hopper (1973:160) cites Hausa, Yucatec Mayan, and Quechua as examples of natural languages exhibiting a similar constraint against the cooccurrence of two glottalics. Akkadian may be added to this list as well if we take Geers' Law (cf. Bomhard 1984b:135; Ungnad—Matouš 1969:27 and 1992:26—27) to be a manifestation of such a constraint.
4. The so-called Germanic and Armenian "consonant shifts" (in German, *Lautverschiebungen*), which can only be accounted for very awkwardly within the traditional framework (cf. Emonds 1972:108—122), turn out to be mirages. Under the revised reconstruction, these branches (together with the poorly-attested Phrygian — for details on Phrygian, cf. Diakonoff—Neroznak 1985: 2—8) turn out to be relic areas. For an excellent and insightful discussion of the Germanic and Armenian consonant shifts along traditional lines, cf. Meillet 1967a:116—124 and 1984:89—96.

Moreover, the reinterpretation of the traditional plain voiceless stops (**p*, **t*, **k̂*, **q*, **q̱ʷ*) as voiceless aspirates, with aspirated ~ unaspirated allophones, overcomes the problems caused by the removal of the traditional voiceless aspirates.

In 1984, Gamkrelidze and Ivanov published their monumental joint monograph entitled *Индоевропейский язык и индоевропейцы: Реконструкция и историко-типологический анализ праязыка и протокультуры [Indo-European and the Indo-Europeans: A Reconstruction and Historical Typological Analysis of a Protolanguage and a Proto-Culture]*. As is to be expected, this massive work (2 volumes, 1,328 pages) contains the most detailed discussion of the Glottalic Theory that has yet appeared. Gamkrelidze and Ivanov's book also contains trajectories of the revised Proto-Indo-European phonological system in the various Indo-European daughter languages, original proposals concerning the morphological structure of the Indo-European parent language (they propose that, at an earlier stage of development, Proto-Indo-European was an active language [strong support for these views is expressed by Lehmann 1995 and 2002, among others]), an exhaustive treatment of the Proto-Indo-European lexicon, and a new theory about the homeland of the Indo-Europeans (they argue that the Indo-European homeland was located in eastern Anatolia in the vicinity of Lake Van). One of the most novel proposals put forth in the book is that Proto-Indo-European may have had labialized dentals and a labialized sibilant. Gamkrelidze—Ivanov also posit postvelars for Proto-Indo-European. Their complete reconstruction is as follows (cf. Gamkrelidze—Ivanov 1984.I:134 and 1995.I:116):

	I.	II.	III.									
1.	(p’)	b[h]	p[h]									
2.	t’	d[h]	t[h]				t’°	d[h]°	t[h]°			
3.	k’	g[h]	k[h]	k̂’	ĝ[h]	k̂[h]	k’°	g[h]°	k[h]°	s	ŝ	ś°
4.	q’	-	q[h]									

Note: The consonants enclosed in the box are considered to be the most reliably reconstructed.

It is not surprising that the new look of Proto-Indo-European consonantism proposed by Gamkrelidze—Ivanov has a distinctly Caucasian appearance about it.

Though the Glottalic Theory has attracted a good deal of attention over the past four decades and has gained a modicum of acceptance (cf. Salmons 1993; Schwink 1994:59—61 and 62—64; Vennemann [ed.] 1989), especially among scholars who belong to the so-called “Leiden School”, it should be noted that there is still some disagreement about the make-up of the traditional voiceless stops and voiced aspirates. Hopper (1973:141—166), for example, reinterprets the traditional voiced aspirates as murmured stops, making no changes to the traditional plain voiceless stops. His system is as follows:

Lehmann					Hopper			
p	t	k	kʷ	=	p	t	k	kʷ
b	d	g	gʷ	=	p’	t’	k’	k’ʷ
bʰ	dʰ	gʰ	gʷʰ	=	b̲	d̲	g̲	g̲ʷ

This differs from the views of Gamkrelidze—Ivanov, who, as noted above, regard the traditional plain voiceless stops as voiceless aspirates, while making no changes to the traditional voiced aspirates. Moreover, they consider the feature of aspiration to phonemically irrelevant, with the choice between the aspirated and unaspirated variants being mechanically determined by the paradigmatic alternations of root morphemes.

In his last major work, Lehmann (2002:198—202, 211—214) accepts a form of the Glottalic Theory. Lehmann (2002:200) reinterprets **b*, **d*, **g*, **gʷ* of traditional Indo-European as **’p*, **’t*, **’k*, **’kʷ* respectively, with preglottalization. However, in the chart on p. 201, he writes **p’*, **t’*, **k’*, **k’ʷ*. In view of the chart on p. 218, I take this to be a typographical error, and, therefore, I have changed the representation of the obstruents in the chart on the following page to reflect this. Furthermore, Lehmann (2002:200) reinterprets the traditional plain voiceless stops and voiced aspirates as voiceless and voiced respectively with aspirated and

unaspirated allophones (this is not reflected in the chart on p. 201 of his book). As in his earlier work (1952:100—102), he (2002:214—216) posits only palato-velars and labio-velars, assuming a secondary status for the plain velars reconstructed by the Neogrammarians. Lehmann reconstructs the following four laryngeals: *ʔ, *h, *χ, *γ. Lehmann (2002:201) assumes that *χ and *γ were voiceless and voiced velar fricatives respectively and that *γ may have had a *w*-offglide. Lehmann's revised system is as follows (2002:201):

Vowels

ī ū
e ē ə o ō
a ā

Consonants

	Obstruents	Resonants	Fricatives
Bilabial:	p ’p b^h	m w	
Dental:	t ’t d^h	n r l y	s
Palato-velar:	k ’k g^h		
Labio-velar:	k^w ’k^w g^{wh}		
Laryngeal:	ʔ		χ γ h

Mention should be made here of Rudolf Normier's (1977:172) system, which is close to that of Gamkrelidze—Ivanov. Normier reinterprets the plain voiced stops of traditional grammar as glottalized stops and the traditional plain voiceless stops as voiceless aspirates, while making no changes to the traditional voiced aspirates. His reconstruction is as follows:

	Occlusives			Fricatives
	Voiceless Aspirated	Voiced Aspirated	Glottalized	
Bilabial:	ph /ph/	bh /bɦ/	ṗ /p’/	
Dental:	th /th/	dh /dɦ/	ṭ /t’/	
Alveolar:				s /s/
Velar:	kh /kh/	gh /gɦ/	ḳ /k’/	x /x/
Labiovelar:	k^wh /k̲h/	g^wh /gɦ/	ḳ^w /k̲’/	x^w /x̲/
Uvular:	qh /qh/	ɢh /ɢɦ/	q̇ /q’/	
Laryngeal:				h /ɦ/

Frederik Kortlandt (1978b:107), on the other hand, proposes the following system (using the dentals for illustration):

	Aspirated	Plain	Glottalic
Lenis:	dh		d
Fortis:		t	

Kortlandt notes (1978b:107—108):

> Though it would be more correct to write *t:*, *t'*, *t'* instead of *t*, *d*, *dh*, I will stick with the traditional transcription. A similar system must be reconstructed for the labial, postvelar, and labiovelar orders.

According to Martin Kümmel (2012:305—306), the stop system developed from Early Proto-Indo-European to Late Proto-Indo-European as follows (a somewhat similar system is reconstructed for Proto-Indo-European by Pooth 2015a:11 [Pooth gives the traditional reconstruction on p. 14]):

	labial	coronal	"palatal" = velar	labiovelar	"velar" = uvular
voiceless	*p	*t	*k	*kʷ	(*q ?)
voiced > breathy	*b > b̤ʱ	*d > d̤ʱ	*g > g̈ʱ	*gʷ > g̈ʷʱ	(*ɢ > ɢ̤ʱ ?)
implosive > voiced	*ɓ > b	*ɗ > d	*ɠ > g	*ɠʷ > gʷ	(*ʛ > ɢ ?)

While the vowels developed from Pre-Proto-Indo-European to Early Proto-Indo-European to Late Proto-Indo-European as follows (Kümmel 2012:306):

Late PIE	Early PIE	Pre-PIE
i u	i u	i u
e o	< ɛ ɔ	<
a	[a]	æ–a ɒ

My own view is that it is necessary to recognize several distinct stages of development within Proto-Indo-European (see the Appendix to Chapter 4 of this book for details) and that the traditional voiced aspirates were a relatively late development (cf. D. G. Miller 1977b:385) — in fact, it is probably only necessary to reconstruct them in the Disintegrating Indo-European ancestors of Indo-Iranian, Armenian, Greek, and Italic. The voiceless aspirates (the traditional plain voiceless stops), on the other hand, seem to be fairly ancient and were most likely inherited by Proto-Indo-European from Proto-Nostratic.

For the latest period of development ("Disintegrating Indo-European"), I would reconstruct the Proto-Indo-European phonological system as follows (this is the reconstruction used throughout this book):

Obstruents:	I	p^h	t^h	k^{yh}	k^h	k^{wh}	
	II	b^h	d^h	g^{yh}	g^h	g^{wh}	
	III	(p’)	t’	$k’^y$	k’	$k’^w$	
			s				
Laryngeals:		ʔ	h	ḫ͡h			
				ʕ͡ɦ			
		$ʔ^w$		ḫ͡h^w			
Resonants:		m/m̥	n/n̥	l/l̥	r/r̥	w/u	y/i
Vowels:		e	o	a	(i)	(u)	ə
		ē	ō	ā	ī	ū	

Notes:

1. Series I is voiceless aspirated; series II is voiced aspirated; and series III is glottalized (ejectives).
2. Voiced aspirates (series II) may have already developed, or at least started to develop, at this stage, but this is uncertain. They are really only needed in order to account for developments in Armenian, Indo-Iranian, Greek, and Italic.
3. The glottalics (series III) became deglottalized just prior to the emergence of the non-Anatolian Indo-European daughter languages. The resulting system was as follows:

Obstruents:	I	p^h	t^h	k^{yh}	k^h	k^{wh}
	II	b^h	d^h	g^{yh}	g^h	g^{wh}
	III	(p)	t	k^y	k	k^w

4. The palatalovelars may already have started to become phonemic at this stage, at least in the ancestors of those daughter languages (the “*satəm*” languages) in which the labiovelars were delabialized. They did not become phonemic in the ancestors of the so-called “*centum*” daughter languages.
5. In the final stage of “Disintegrating Indo-European”, the laryngeals had been mostly lost (see Chapter 4 for details).

An important consideration needs to be mentioned at this point. While it seems probable that the glottalics were originally post-glottalized in all positions in Proto-Indo-European, there is evidence from some of the daughter languages (such as Winter’s Law [cf. Collinge 1985:225—227; Birnbaum 1985], the West Scandinavian pre-aspiration, and the Danish stød, for example [cf. Kortlandt 1981c, 1988b, 1988c, 1989b, 1998, 1999, 2007, and 2012; but cf. Rießler 2004 for an opposing view]) that there may have been dialectal variation in the timing of glottalization before their ultimate loss. This seems to be what Kloekhorst (2016:226—228) is implying regarding the development of the glottalics in Anatolian. The typological

parallel that I have in mind here as a possible model for what timing of glottalization rules may have been like in some dialects of "Disintegrating Indo-European" is the Native American language Sm̓algyax (Coast Tsimshian) spoken in northwestern British Columbia and southeastern Alaska, as described by Dunn (1995, Part II, 4):

> If a glottalized segment occurs before a vowel, the glottalic closure coincides with the consonant closure and the vocal cords are released after the consonant is released (k', k̲', p', t'). If the glottalized segment occurs after a vowel, the glottalic closure occurs before the consonant closure ('k, 'k̲, 'p, 't); if such a glottalized segment is word final, the vocal cords are unreleased thruout the production of the consonant sound. When a glottalized segment occurs between vowels, it is of the former type (k', p', t') if the second of the two vowels has the greater stress; it is of the latter type ('k, 'p, 't) when the first of the two vowels has the greater stress.

Such a scenario is hinted at by Salmons (1993:24) but not elaborated upon.

Thus, in accordance with the example of the Sm̓algyax patterning just outlined above, the following timing of glottalization rules may tentatively be postulated for at least some dialects of Proto-Indo-European:

1. If a glottalized segment occurs before a vowel, it is post-glottalized: /Ċ/ → [Cˀ]/__V.
2. If a glottalized segment occurs after a vowel, it is pre-glottalized: /Ċ/ → [ˀC]/V__.
3. If a glottalized segment occurs word final before pause, it is deglottalized and unreleased: /Ċ/ → [C']/__#.
4. If a glottalized segment occurs between vowels, it is post-glottalized if the accent falls on the second vowel: /Ċ/ → [Cˀ]/V__V́.
5. If a glottalized segment occurs between vowels, it is pre-glottalized if the accent falls on the first vowel: /Ċ/ → [ˀC]/V́__V.

Notes:
1. Ċ = any glottalic (/p'/, /t'/, /k'/, /k'^{w}/).
2. Rule no. 2 would account for Winter's Law in Balto-Slavic.
3. Rule no. 2 would account for the "vestjysk stød" in the western dialects of Danish and preaspiration in West Scandinavian.
4. Kloekhorst has recently (2016:226—228) proposed that the glottalics became pre-glottalized in Proto-Anatolian and that the glottalization was eventually lost: **t'*, **k'*, **k'^{w}* → **'t*, **'k*, **'k^{w}* → **t*, **k*, **k^{w}*. The above rules would account for Kloekhorst's views.

The Glottalic Theory has not escaped criticism (cf., for example, Szemerényi 1996: 151—153). One of the sharpest criticisms concerns the alleged implausibility of the changes that would be required to arrive at the plain voiced stops found in the majority of the daughter languages. This issue has been dealt with at length by Paul

D. Fallon in Chapter 6, Ejective Voicing, of his 2002 book *The Synchronic and Diachronic Phonology of Ejectives*. Here, Fallon provides empirical support for the Glottalic Theory of Proto-Indo-European consonantism. After presenting and discussing in great detail evidence from a number of languages, Fallon (2002:278—285, §6.7) examines and evaluates the plausibility of various paths for ejective voicing, as follows:

1. Direct Voicing: Fallon describes the process of direct voicing of ejectives as the spread of [voice] from a vowel, "a rather direct change which telescopes what historically may have been a series of minute changes. The results will often be a change to a pulmonic voiced consonant with loss of glottal constriction…" On the other hand, "we can express this as indirect voicing in two parts, as the delinking of the laryngeal feature [c.g.], followed by default fill-in (or spreading)."
2. Indirect Voicing: "The indirect voicing of ejectives involves their loss of distinct glottalization and the subsequent voicing of the voiceless unaspirated series." This is the scenario that I believe best explains the Indo-European developments (see Chapter 5 for details; same conclusion by Arrick 2013).
3. Laryngealization: "Another commonly posited path of development from ejective to voiced is via laryngealization."
4. Implosivization: "Many linguists now believe that PIE ejectives became implosive." As an example, a little later on, Fallon suggests that, within the Quichean languages, ejectives may have become implosives as follows:

   Voiceless ejective > voiceless implosive > voiced implosive

   At a later date, the implosives would have been changed to plain voiced stops. This is the scenario favored by Kümmel (2012:303—306).

Fallon (2002:285) summarizes his findings by noting:

> In sum, we have seen that there is a tremendous amount of variation in the production of ejectives, both cross-linguistically and individually. I have discussed four possible directions of change from ejective to voiced: direct and indirect voicing, laryngealization, and implosivization… Creaky or laryngealized voicing seems to be fairly common, as we have seen in Kabardian, for example. And implosivization has occurred independently in a number of African and Central American languages. I feel that these changes are valid possibilities, and that given dialectal variation, they both could be paths of ejective development. And I hope that I have shown that we should not … automatically rule out the possibility of direct phonetic or phonological change.

And further (2002:288):

> … I also hope that I have dispelled the myth of implausibility of ejective voicing. The data gathered here do not by any means validate the Ejective

> Model — such validation will require careful study and reassessment of almost 200 years of assumptions (such as the papers in Vennemann 1989). However, they do help rebut some of the Glottalic Theory's sharpest criticisms and should breathe new life into the debate. Garrett (1991: 803) said the Glottalic Theory "was an exciting proposal…one whose time has come and gone". But like Mark Twain, I think rumors of its death are greatly exaggerated.

For additional information on the patterning of glottalics, see especially Greenberg 1970 and Wedekind 1990a. It should be mentioned that Wedekind finds no support from the Semitic languages of Ethiopia for the types of root structure constraints involving glottalics posited for Proto-Indo-European. But, Gamkrelidze (2010:170, fn. 2) rightly points out that these constraints are a common phonetic *tendency*, not a universal (see also Salmons 1993:36).

Another criticism of the Glottalic Theory revolves around Germanic **rīk-* 'ruler', which is universally considered to be a loanword from Celtic **rīg-* (cf. Old Irish *rí* 'king'; Old Welsh *ri* 'king'; Gaulish *rigo-* in the toponym *Rigomagus*; etc.). The objection here is that **rīk-* requires a consonant shift from voiced to voiceless within Germanic, which is not possible within the framework of the Glottalic Theory. However, a careful examination shows that there is no basis for this objection. The form that was borrowed was undoubtedly **rīks* (with devoicing of [g] to [k] before [s] already in Celtic [cf. Gaulish *-rīx* in personal names, such as *Dumnorīx*, *Vercingetorīx*, etc.]) (cf. Gothic *reiks* '[n.] prince, ruler; [adj.] mighty, honorable, powerful'; Old Icelandic *ríkr* 'mighty, powerful' [cf. Orël 2003:305 Proto-Germanic **rīkz*; Kroonen 2013:412—413 Proto-Germanic **rīk-* 'ruler, king'; Feist 1939:396—397; Lehmann 1986:283; De Vries 1977:446]). The derivative forms found in Germanic (such as Gothic *reiki* 'rule, power, authority', *reikinōn* 'to rule, to govern', etc.) were then built on the stem **rīk-* (cf. Lehmann 1986:283; Orël 2003:305). We should note that there are loanwords in which consonants are clearly not shifted in Germanic, for instance, Old High German *kellari* 'cellar' (New High German *Keller*), Old Saxon *kelleri* 'cellar', Middle Dutch *kelre* 'cellar' (Dutch *kelder*), etc., borrowed from Latin *cellārium* 'relating to a store-room' by Germanic tribes around the end of the first century BCE (cf. Ramat 1998:388; Kluge—Mitzka 1967:363—364; Kluge—Seebold 1989:365; Vercoullie 1898:133).

Two additional criticisms have been directed against the Glottalic Theory. The first concerns the example of Javanese, which is alleged to have a typologically rare series of voiced aspirates, together with modally voiced and tenuis consonants but without an accompanying series of voiceless aspirates, thus violating Jakobson's famous observation, noted above, that data collected from the study of a great number of the world's languages have failed to turn up any systems in which voiced aspirates are added to the pair plain voiceless stop ~ plain voiced stop unless there are also corresponding voiceless aspirated stops in the system (cf. Jakobson 1971[1957]:528; Martinet 1970:115). Even if the description of the Javanese phonemic inventory turns out to be correct (itself in doubt [see above]), everything about it (syllable structure, phonotactic constraints, suprasegmentals, etc.) is so utterly different from what is assumed to have existed in Proto-Indo-European (cf. Byrd 2010) that Javanese serves as an extremely poor model on which to base ideas

about the Proto-Indo-European phonological system — especially when Javanese is considered within the context of related Austronesian languages (for an excellent introduction to the Indonesian language, including its history and relationship to other Austronesian and Malayic languages, cf. Sneddon 2003; see also William D. Davies 2010, in which Javanese is discussed and compared with Madurese and Indonesian, and Adelaar—Himmelmann [eds.] 2004 for detailed descriptions of the principal Austronesian languages of Asia and Madagascar [Javanese is discussed in Chapter 21]). Moreover, the discovery of a single alleged counter-example still does not invalidate Jakobson's observation but merely becomes a footnote to it. Unique types do indeed exist, but they are anomalies and are not exemplary of language in general. Accordingly, the conventional reconstruction of the Proto-Indo-European stop system, with plain voiceless, plain voiced, and voiced aspirated stops, without corresponding voiceless aspirates, remains typologically improbable. To reiterate the obvious: When there are two competing reconstructions for a given proto-language, the one that has the greatest typological support should be favored.

The final criticism concerns the fact that no attested Indo-European daughter language has preserved a series of glottalized stops (ejectives). This was the same objection that was raised against de Saussure's "coefficents sonantiques" prior to the identification of one of them in Hittite in 1927 by Cuny and Kuryłowicz. In light of Fallon's work, this criticism hardly needs to be taken seriously — ejectives can and do change, though they can also remain stable. If the ejectives were lost early enough, it is not at all surprising that none of the daughter languages has preserved them as such. Fortunately, there are enough clues in what has survived to substantiate the Glottalic Model. Details on how the revised Proto-Indo-European phonological system developed into the phonological systems found in the various Indo-European daughter languages are discussed in Chapter 5.

CHAPTER FOUR

THE RECONSTRUCTION OF THE PROTO-INDO-EUROPEAN PHONOLOGICAL SYSTEM

4.1. THE PROTO-INDO-EUROPEAN LARYNGEALS

The Indo-European parent language is assumed to have had one or more sounds conventionally called "laryngeals", though this label refers to these sounds as a group and is not an indication of their phonetic make-up. The basic (and most widely-accepted) tenets of the Laryngeal Theory may be summarized as follows:

1. The Indo-European parent language possessed one or more laryngeals — most scholars posit either three (Beekes, Benveniste, Burrow, Clackson, Couvreur, Cowgill, Eichner, Fortson, Keiler, Lejeune, Meier-Brügger, Watkins) or four distinct laryngeals (Bomhard, Kerns—Schwartz, Kuryłowicz, Lehmann, Sapir, Mallory—Adams, Sturtevant, Swiggers). Collinge, Hammerich, Szemerényi, Vaillant, and Zgusta posit just one laryngeal. Martinet (1975[1967]:127), on the other hand, posits as many as ten, while Puhvel (1965:97) posits six.
2. The laryngeals were lost as independent phonemes in all branches of Indo-European except for Anatolian (cf. Bomhard 1976:222—231 and 1984b:119—131; Lehmann 1952:25—28; Puhvel 1965:79—92; Sturtevant 1942:35—65 and 1951:47—55) and Armenian, where the laryngeal *H_2 (*$\underset{\wedge}{\partial}_2$) appears as *h* initially before vowels in a small number of words (cf. Austin 1942:22—25; Bomhard 1976:231—232 and 1984b:82—84; Greppin 1981:120—122; Sturtevant 1942:29—30; Winter 1965b:102).
3. The loss of preconsonantal laryngeals after short vowels caused the compensatory lengthening of these vowels (cf. Benveniste 1935:149; Bomhard 1984b:17; Kuryłowicz 1935:28; Lehmann 1952:85—86; Lindeman 1970:17, 1987:21 and 50—59; Sturtevant 1942:66—71).
4. One or more of the laryngeals had an assimilatory effect on contiguous vowels — it is usually assumed that *H_2 (*$\underset{\wedge}{\partial}_2$) and *$H_4$ (*$\underset{\wedge}{\partial}_4$) changed a contiguous **e* to **a* and that *H_3 (*$\underset{\wedge}{\partial}_3$) changed a contiguous **e* to **o* (cf. Benveniste 1935:149; Couvreur 1937:69; Lindeman 1970:17 and 1987:22; Sturtevant 1942:35—46).
5. The so-called "long syllabic resonants" (*$\underset{\circ}{m}\bar{}$, *$\underset{\circ}{n}\bar{}$, *$\underset{\circ}{l}\bar{}$, *$\underset{\circ}{r}\bar{}$) are to be reinterpreted as sequences of *$\underset{\circ}{m}$, *$\underset{\circ}{n}$, *$\underset{\circ}{l}$, *$\underset{\circ}{r}$ plus laryngeal, that is, *$\underset{\circ}{m}H$, *$\underset{\circ}{n}H$, *$\underset{\circ}{l}H$, *$\underset{\circ}{r}H$ (cf. Burrow 1973:87; Lehmann 1952:86—90; Lindeman 1987:21—22; Sturtevant 1942:69—71).
6. Some examples of voiceless aspirates in Indo-Aryan owe their origin to the former presence of a laryngeal between an immediately preceding plain voiceless stop and an immediately following vowel: **pH*, **tH*, **kH* > *ph*, *th*, *kh*

(cf. Kuryłowicz 1935:29; Lehmann 1952:80—84; Lindeman 1970:77—81 and 1987:88—91; Sturtevant 1942:83—86).

7. Proto-Indo-European had no initial vowels; in every instance where initial vowels had been reconstructed for Proto-Indo-European by the Neogrammarians, a preceding laryngeal has been lost (cf. Kuryłowicz 1935:29).
8. The laryngeals could have both syllabic and non-syllabic allophones depending upon their environment (cf. Benveniste 1935:149; Couvreur 1937:303—309; Keiler 1970:70—86). That is to say that the patterning of the laryngeals was similar to that usually assumed for the resonants. The syllabic form of the laryngeals is commonly associated with the schwa primum (*ə) reconstructed for Proto-Indo-European by the Neogrammarians.

At first glance, the form of the Laryngeal Theory that would seem to conform best to the evidence found in the daughter languages would appear to be that which assumes four laryngeals for the Indo-European parent language. Specifically, four laryngeals seem to be needed for Pre-Anatolian Proto-Indo-European and for that form of Proto-Indo-European existing immediately after the separation of the Anatolian languages from the main speech community. However, for the Indo-European antecedent of the non-Anatolian daughter languages ("Disintegrating Indo-European"), only one laryngeal is to be reconstructed (cf. Polomé 1987a:167).

Disintegrating Indo-European must have had the full complement of long and short vowels traditionally reconstructed (cf. Szemerényi 1967:67—87). Furthermore, Disintegrating Indo-European must have had initial vowels — to assume otherwise would be to ignore the evidence of the non-Anatolian daughter languages as well as to deny the efficacy of the Comparative Method. This can only mean that the vowel-lengthening and vowel-coloring effects customarily attributed to the laryngeals must have taken place prior to the Disintegrating Indo-European period. On the surface, it would thus appear as if one could almost get by without positing any laryngeals at all for this period. At least one laryngeal must be reconstructed for Disintegrating Indo-European, however, to account for developments in the non-Anatolian daughter languages such as:

1. The Indo-Aryan voiceless aspirates (cf. Lehmann 1952:80—84).
2. The Greek prothetic vowels (cf. Austin 1941:83—92; Beekes 1969:18—74; Cowgill 1965:151—153; Lejeune 1972:204).
3. The Greek rough breathing, in part (cf. Sapir 1938:248—274; Sturtevant 1942:76—78).
4. Armenian initial *h*, in part (cf. Austin 1942:22—25; Bomhard 1984b:82—84; Greppin 1981:120—122; Sturtevant 1942:29—30; Winter 1965b:102).
5. Some aspects of the Balto-Slavic intonations (cf. Vaillant 1950:241—246).
6. The Germanic Verschärfung (also known as "Holtzmann's Law") (cf. Jasanoff 1978a:77—90; Lehmann 1952:36—46 and 1965:213—215; Lindeman 1964).

No doubt, it was this single laryngeal of Disintegrating Indo-European that had a syllabic allophone, the traditional schwa primum (*ə).

For Pre-Anatolian Proto-Indo-European, four laryngeals would seem to be needed to account for:

1. Disintegrating Indo-European *e without a corresponding Anatolian laryngeal reflex (this is Kuryłowicz's *$ə_1$, Sturtevant's *$'$).
2. Disintegrating Indo-European *a with a corresponding Anatolian laryngeal reflex (this is Kuryłowicz's *$ə_2$, Sturtevant's *x).
3. Disintegrating Indo-European *e and/or *o with a corresponding Anatolian laryngeal reflex (this is Kuryłowicz's *$ə_3$, Sturtevant's *γ). It should be noted that Kuryłowicz assumes that this laryngeal changed a contiguous *e to *o, while Sturtevant (1938:104—111 and 1942:20) assumes that this laryngeal did not color contiguous vowels.
4. Disintegrating Indo-European *a without a corresponding Anatolian laryngeal reflex (this is Kuryłowicz's *$ə_4$, Sturtevant's *$ʾ$ [in later works, Sturtevant writes *h]).

One of the most difficult riddles to solve has been and continues to be the determination of the probable phonetic values of the various laryngeals (cf. Kessler no date). Sturtevant (1942:19), following Sapir, assigns the following phonetic values to the laryngeals: *$'$ = a glottal stop with frontal timbre; *$ʾ$ (in later works, *h) = a glottal stop with velar timbre; *x = a voiceless velar spirant; *γ = a voiced velar spirant. According to Lehmann (1952:103—108), *$ʔ$ was either a weakly aspirated glottal fricative or a pharyngeal fricative; *h was apparently a glottal aspirated fricative; *x was a voiceless velar fricative; and *γ was a rounded voiced velar fricative. Keiler (1970:68) posits the following values: *H_1 = a voiceless glottal fricative /h/; *H_2 = a voiceless pharyngeal fricative /ħ/; and *H_3 = a voiced pharyngeal fricative /ʕ/. Finally, Colarusso (1981:550) assigns the following values: *H_1 = either a glottal stop or voiceless and voiced pharyngealized velar fricatives; *H_2 = voiceless and voiced pharyngeal fricatives; *H_3 = either labialized voiceless and voiced pharyngeal fricatives or a labialized glottal stop; and *H_4 = a voiceless glottal fricative.

According to Colarusso (1981:512), Couvreur (1937:264), Fortson (2004:58 and 2010:64), Messing (1947:223—225), Sturtevant (1942:19 and 1951:54), and Pooth (2015a:11), *H_1 was a glottal stop /ʔ/. The interpretation of *H_1 as a glottal stop explains why this laryngeal did not color contiguous vowels. As noted by Catford (1977b:105): "simple glottal stop has no influence on the quality of contiguous vowels". This is verifiable from both Northwest Caucasian and Arabic, where glottal stops have no effect on vowel quality (cf. Colarusso 1981:511 for Northwest Caucasian and Al-Ani 1970:60—62 for Arabic). Moreover, loss of a glottal stop between an immediately preceding short vowel and an immediately following non-syllabic causes compensatory lengthening of the vowel in Akkadian and Arabic (cf. Cantineau 1960:79; Couvreur 1937:288—289; Moscati [ed.] 1964: 61—64; J. Watson 2002:18—19). Note the following examples from Akkadian (these are taken from Couvreur 1937:288—289):

1. Akkadian **raʔšu* > *rāšu* (later *rēšu*) ‘head’; Hebrew *rōʔš* [רֹאשׁ] ‘head’; Aramaic *rēšā* ‘head’; Phoenician *rʔš* ‘head’; Arabic *raʔs* ‘head’; Epigraphic South Arabian *rʔs* ‘head’; Śḥeri / Jibbāli *réš*/*réš* ‘head’; Soqoṭri *riy* ‘head’; Ugaritic *rỉs* ‘head’; Geez / Ethiopic *rəʔəs* ‘head’ [ርእስ]; Tigrinya *rəʔsi* ‘head’; Tigre *räʔas* ‘head’; Amharic *ras* ‘head’. Cf. Militarëv 2011:75, no. 38.
2. Akkadian **raḥmu* > **reḥmu* > **reʔmu* > *rēmu* ‘grace, mercy’; Hebrew *raḥūm* [רַחוּם] ‘compassionate’; Arabic *raḥima* ‘to have mercy, compassion’, *raḥma* ‘pity, compassion’; Śḥeri / Jibbāli *raḥám* ‘to be kind’; Mehri *rəḥām* ‘to be kind to someone’; Ḥarsūsi *reḥam* ‘to pity’; Ugaritic *rḥm* ‘to be kind’; Tigre *räḥama* ‘to have pity on’ (Arabic loan).
3. Akkadian **baʿlu* > **beʿlu* > **beʔlu* > *bēlu* ‘owner, lord’; Hebrew *baʿal* [בַּעַל] ‘lord, owner’; Ugaritic *bʿl* ‘owner of the house’; Arabic *baʿl* ‘husband, master, owner’; Epigraphic South Arabian *bʿl* ‘master, owner’; Ḥarsūsi *bāl* ‘master, lord’; Mehri *bāl* ‘owner, possessor’; Śḥeri / Jibbāli *báʿal* ‘person owning’; Soqoṭri *baʿl* ‘master, lord’; Geez / Ethiopic *baʿāl* [በዓል] ‘owner, master’; Tigre *bäʿal* ‘master’; Tigrinya *bäʿal*, *baʿal* ‘master’; Amharic *bal* ‘master’.

Identical developments are assumed for *H_1 in Proto-Indo-European. This laryngeal is not directly attested in any of the Indo-European daughter languages, including Hittite (cf. Bomhard 1976:230; Sturtevant 1942:53 and 1951:154).

Additional confirmation that *H_1 was a glottal stop is provided by Sanskrit (3rd sg.) *píbati* ‘drinks’, Latin *bibit* ‘drinks’, Old Irish *ibid* ‘drinks’. The Proto-Indo-European antecedent would have been the reduplicated 3rd sg. verbal form *p^hi-p^hH_1-et^hi ‘drinks’ (or, in traditional terms, *pi-pe_1-eti), that is, *p^hi-$p^hʔ$-et^hi. Now, according to Gamkrelidze, Hopper, and Ivanov, glottalized stops become voiced stops in Sanskrit, Latin, and Old Irish. Likewise, we would expect the cluster *-$p^hʔ$- to become /b/ in these languages, and this is exactly what we do in fact find. The following developments may be assumed (cf. Gamkrelidze—Ivanov 1995.I:856): *p^hi-$p^hʔ$-et^hi > (with deaspiration of *-p^h- in the cluster *-$p^hʔ$-) *p^hi-$pʔ$-et^hi > (with reanalysis of *-$pʔ$- as *-p'-) *p^hi-p'-et^hi > (with deglottalization) *p^hi-p-et^hi > (with voicing of medial *p) *p^hi-b-et^hi > (with deaspiration of voiceless aspirates) *pi-b-eti > Sanskrit *píbati* ‘drinks’, Latin *bibit* ‘drinks’, Old Irish *ibid* ‘drinks’.

Kuryłowicz (1935:29—30) sets up *e_4 (*H_4) to account for those cases in which an *a* in the non-Anatolian daughter languages corresponds to an *a* in Hittite, and Hittite lacks a contiguous laryngeal reflex. That is to say that *H_4 is not directly attested in Hittite or in any of the other daughter languages (cf. Bomhard 1976:230; Sturtevant 1942:42 and 1951:51—52), though its former presence can be determined by the fact that it changed a contiguous **e* to **a* and by the fact that it caused compensatory vowel lengthening when lost between an immediately preceding short vowel and an immediately following non-syllabic. According to Hopper (1977a:49—50), typological evidence implies that the voiceless laryngeal fricative /h/ should be added to the Proto-Indo-European phonemic inventory, and this coincides with the phonetic value assigned to *H_4 by Colarusso (1981:512), Lehmann (1952:108), and (apparently) Sturtevant (1951:52). In terms of distinctive feature theory, /h/ is [+cons, +low, -voice, +cont, +grave]. As far as we are

concerned, the most important feature is [low]. According to Chomsky—Halle (1968:305), the articulatory gesture behind the feature [low] is a "lowering [of] the body of the tongue below the level it occupies in the neutral position", while Colarusso (1981:509) defines it as "an opening of the oral cavity to enhance resonance". It was the presence of this feature that was responsible for the lowering of a contiguous *e to *a. Finally, we may note that developments similar to those assumed for *H_4 in Proto-Indo-European are found in Ubykh and in the Circassian languages, where /h/ (and /h^{w}/) lowers and colors contiguous vowels and also causes compensatory vowel lengthening when lost (cf. Colarusso 1975:396).

Reflexes of *H_2 (*$\hat{\partial}_2$) are found in Hittite and the other older Anatolian languages (that is, Palaic and Cuneiform and Hieroglyphic Luwian), where they are written (*ḫ*)*ḫ* (cf. Fortson 2010:178; Sturtevant 1942:35 and 1951:47). This laryngeal also survives in Lycian, where it is written *χ*. Like *H_4, *H_2 lowers a contiguous *e to *a. On this basis, we would expect *H_2 also to be characterized by the presence of the feature [low]. Good candidates to assign as the phonetic values of *H_2 would be the multiply-articulated pharyngeal/laryngeals /ħ͡h/ and /ʕ͡ɦ/ (they could also have been adytals [+CP, +low]). Not only are these sounds marked by the presence of the feature [low], which accounts for the lowering of adjacent vowels, but they also make it easy to account for the fact that *H_2 appears as *h* in Armenian before full-grade vowels. We can envision a change of *ħ͡h into *h and of *ʕ͡ɦ first into *$ɦ$ and then into *h similar to what is found in the Ashkharwa dialect of Abkhaz (cf. Colarusso 1981:516). The resulting *h would have subsequently been lost in all of the non-Anatolian daughter languages except Pre-Armenian. As in Ashkharwa, we may venture a guess that *ħ͡h and *ʕ͡ɦ developed from the earlier pharyngeals *$ħ$ and *$ʕ$ respectively in Pre-Anatolian Proto-Indo-European. Indeed, support for such an assumption comes from the lexical parallels between Proto-Indo-European and Proto-Afrasian, where Proto-Indo-European *H_2 corresponds to Proto-Afrasian *$ħ$ and *$ʕ$. Finally, we should take note of Jakobson's (1971[1956]:518—520) description of similar sounds in Arabic (see also J. Watson 2002:44—45):

> … /ḥ/ is essentially a pharyngealized laryngeal. Of the two phonemes of this type, /ḥ/ is usually produced without voice and /ʿ/ with voice. Since a considerable part of the air used with /ʿ/ is consumed by voicing alone, this phoneme is a lenis, in contradistinction to the fortis /ḥ/. Thanks to the pharyngeal contraction, the voice-pitch in /ʿ/ and the whisper-pitch in /ḥ/ are very low: "In passing to /ʿ/ from a preceding vowel the voice has to descend rapidly, often through more than an octave, and is cut off at its lowest pitch. If a vowel *follows*, the pitch begins at its lowest level and rises quickly, through a similar interval, to normal vowel pitch." (1971[1956]:518—519)
>
> As to the influence upon the adjacent vowels, the componential analysis of a phoneme cannot proceed from the contextual variants of neighboring phonemes: often the variation is due not to a single feature but to a combination of concurrent features. Furthermore, in many instances the pharyngeals modify adjacent vowels in the same direction as pharyngealized buccals. In colloquial Egyptian both the pharyngealized buccals and the

> pharyngeals appear to exert a modifying retracting influence on preceding and following a-vowels (Gairdner, p. 46f.). In the dialect of El-Hamma, Cantineau observes that the /a:/ is pronounced "entre *a* et *o* ouvert" in contact with pharyngealized dentals, while in contact with pharyngeals it is realized as "*a* moyen français", in contact with velars it oscillates between the two positions mentioned, and in other contexts it is a front vowel. In the same dialect the phoneme /u:/ is shifted towards the closed *o* in the neighborhood of pharyngealized dentals, velars, and pharyngeals (1951, p. 78f.). (1971[1956]: 520)

It is more difficult to determine the phonetic value of $*H_3$ ($*\underline{ə}_3$) than of any of the other laryngeals. Reflexes of $*H_3$ are also found in the older Anatolian languages (cf. Bomhard 1976:228—230; Fortson 2004:156 and 2010:178; Sturtevant 1942:44 and 1951:49—51). Kuryłowicz (1935:28—30) tried to show that $*H_3$ changed a contiguous *e to *o, but Sturtevant (1938:104—111 and 1942:20) has convincingly argued against such an assumption. Indeed, forms such as Hittite *me-ḫur* 'time' beside Gothic *mēl* 'time' and Latin *mētior* 'to measure', for example, in which the vowel *e* is found directly before a laryngeal reflex in Hittite, are difficult to explain if, as claimed by Kuryłowicz, $*H_3$ changed a contiguous *e to *o. Now, a more careful examination indicates that $*H_2$ and $*H_3$ may actually have had the same vowel-coloring effects. This is an important finding, for, surprisingly, it raises the possibility that $*H_2$ and $*H_3$ may have been identical in Proto-Indo-European. Such an assumption would mean that only one laryngeal, instead of two, was preserved in the older Anatolian languages. Moreover, by reexamining the relevant data from the Indo-European daughter languages, we find that the assumption that $*H_2$ and $*H_3$ were identical actually provides the key to understanding the full scope of the vowel-coloring effects of the laryngeals in Proto-Indo-European. We know that $*H_2$ lowered and colored a contiguous *e to *a. As in the Arabic case discussed by Jakobson above, we would expect this laryngeal to have had a similar effect on the vowels *i and *u in early Proto-Indo-European as well. That is to say that we would expect $*H_2$ to have lowered and colored a contiguous *i to *e and a contiguous *u to *o. In fact, there is some evidence — albeit controversial — within Indo-European itself to support this, as the following examples illustrate:

1. Early Proto-Indo-European $*H_2ink^h$- > later Proto-Indo-European $*H_2enk^h$- 'to reach, to come to, to arrive at' (Pokorny 1959:316—318 reconstructs *$enk\hat{}$-, *$nek\hat{}$-, *$enk\hat{}$-, *$n̥k\hat{}$-): Hittite (3rd sg.) *ḫi-in-ik-zi* 'to present, to deliver, to offer, to allot'; Sanskrit *aśnóti* 'to reach, to come to, to arrive at, to get, to obtain; to master; to offer'; Latin *nancior* 'to get, to gain, to obtain', *nanciscor* 'to get, to gain, to receive, to meet'; Tocharian A *ents*-, B *eṅk*- 'to seize, to take'. Cf. Puhvel 1984— .3:289—292; Melchert 1994a:143—144. The Hittite form directly attests $*H_2ink^h$-. Note: That the transition from *i to *e was already taking place as early as Hittite is shown by forms such as (nom.-acc. sg.) *ḫé-en-gur* 'consignment, offering, oblation, gift, tribute' beside (nom.-acc. sg.) *ḫi-in-ku-wa-ar*. The same variation occurs in (nom.-acc. sg.) *ḫé-en-kan* 'death, doom, deadly, disease, plague' alongside (nom.-acc. sg.) *ḫi-in-kán*.

2. Early Proto-Indo-European *H_2ul- > later Proto-Indo-European *H_2ol- ‘to destroy’ (Pokorny 1959:777 reconstructs *ol-$[e]$-): Hittite (3rd sg.) $ḫu$-ul-la-a-i ‘to smite, to destroy, to defeat’; Latin *ab-oleō* ‘to destroy’; Greek ὄλλῡμι ‘to destroy’. Cf. Couvreur 1937:143—144; Cowgill 1965:146—147 and 157 (Cowgill derives the Greek form from *$Oḷ$-ne-O-mi and considers the o to be a replacement for original α — nonetheless, Cowgill accepts the comparison with Hittite $ḫu$-ul-la-a-i). The Hittite form directly attests *H_2ul-. Note: Kloekhorst 2008b:358—360; Melchert 1994a:55—56, 65—66, and 82; Polomé 1965:18; and Puhvel 1984— .3:368 reject this etymology.
3. Early Proto-Indo-European *H_2um- > later Proto-Indo-European *H_2om- ‘all, whole’: Hittite (nom. sg.) $ḫu$-u-ma-an-za ‘all, whole’; Latin *omnis* ‘all, every, whole”. Cf. Couvreur 1937:144—146; Kronasser 1956:41; Pedersen 1938:165. The Hittite form directly attests *H_2um-. Note: Polomé (1965:18) and Puhvel (1984— .3:380) reject this etymology — Puhvel derives Latin *omnis* from **opnis*. On the other hand, Walde—Hofmann (1965—1972.II:209—210) mention Oscan *úmbn*, which points to earlier **omb-nis* and not **opnis* as the source of both the Oscan form and Latin *omnis*. **omb-nis* may contain an epenthetic *b*, in which case the original form would have been **om-ni-s*. Here, *-ni-* is a suffix. Likewise, in Hittite $ḫu$-u-ma-an-za, the stem is *$ḫum$-, and the *-anz(a)* is a suffix (< *-*onts* or *-$n̥ts$). Thus, this etymology can be revived if we consider the original form to have been *H_2um-, which later became *H_2om-, with *-o-* from earlier *-u-* under the influence of the preceding laryngeal. Such an explanation overcomes the objections raised against this etymology based upon the irregular correspondence of Hittite *u* and Latin *o*.

This explains the origin of at least some cases of so-called “non-apophonic” **e* and **o*. At a later date, secondary *e*- or *o*-grade forms (corresponding to original non-apophonic **o* and **e* respectively) may have developed in accordance with the regular **e* ~ **o* ablaut patterning. Where secondary *e*- or *o*-grade forms did not develop, we would have examples of non-apophonic **e* or **o*, as the case may be. An important point needs to be made here: **i* and **u* had more than one origin in Proto-Indo-European. In some cases, **i* and **u* were original (that is to say, inherited from Proto-Nostratic), while, in other cases, they resulted from the stress-conditioned weakening of **Vy* and **Vw* respectively. Only original **i* and **u* were lowered and colored to **e* and **o* respectively when contiguous with *H_2 (and *H_3) and *H_4. When **i* and **u* resulted from the stress-conditioned weakening of **Vy* and **Vw*, however, they were not lowered to **e* and **o* respectively in the neighborhood of *H_2 (and *H_3) and *H_4, since such a change would have disrupted the integrity of the ablaut relationship.

The question of whether or not labialized laryngeals should be reconstructed for Proto-Indo-European will not be considered here, though there is at least circumstantial evidence that one or more labialized laryngeals may have existed in the Indo-European parent language (cf. the Appendix at the end of this chapter for more information as well as: Colarusso 1981:503—552; Adrados 1961, 1981b, and 1981c; Martinet 1970:212—234 and 1975[1967]:114—143; Puhvel 1965:86—92;

Watkins 1965b:89). We may note in passing that there is even some evidence that Proto-Indo-European may also have had labialized dentals as well as a labialized sibilant (cf. Gamkrelidze—Ivanov 1984.I:122—134 and 1995.I:111—115).

We may summarize our findings by setting up the following matrix:

	*ʔ	*h	*ħ͡h	*ʕ͡ɦ
Traditional *H_1 (*$\underset{\frown}{ə}_1$)	+	-	-	-
Traditional *H_4 (*$\underset{\frown}{ə}_4$)	-	+	-	-
Traditional *H_2 (*$\underset{\frown}{ə}_2$)	-	-	+	+
Traditional *H_3 (*$\underset{\frown}{ə}_3$)	-	-	+	+
e lowered and colored to *a*	-	+	+	+
i lowered and colored to *e*	-	+	+	+
u lowered and colored to *o*	-	+	+	+
Preserved in Anatolian	-	-	+	+
Partially preserved in Armenian	-	-	+	+

Now that we have determined the probable phonetic values of the Proto-Indo-European laryngeals, we can turn to the question of their prehistoric development.

On the basis of comparison with other Nostratic languages, especially Proto-Afrasian, the following laryngeals may be posited for Pre-Proto-Indo-European: *ʔ, *h, *ħ, and *ʕ. At this time, the laryngeals were stable and non-vowel coloring.

The earliest change to take place was the development of the voiceless and voiced pharyngeal fricatives *ħ and *ʕ into the multiply-articulated pharyngeal/laryngeals *ħ͡h, and *ʕ͡ɦ, respectively. Colarusso (1981:516) cites a similar development in the Ashkharwa dialect of Abkhaz. These pharyngeal/laryngeals, as also the voiceless laryngeal fricative *h, contained the feature [low] as part of the simultaneous bundle of features characterizing these sounds. These were the so-called "*a*-coloring laryngeals". It was at the end of this stage of development that the Anatolian languages became separated from the main speech community. In Anatolian, the laryngeals *ʔ and *h were lost.

In early post-Anatolian Proto-Indo-European, *ʔ and *h were lost initially before vowels, while *ħ͡h > *h and *ʕ͡ɦ > *ɦ > *h in the same environment. In later post-Anatolian Proto-Indo-European ("Disintegrating Indo-European"), all laryngeals first merged into *h. *h (from earlier *ħ͡h and *ʕ͡ɦ) was then lost initially before vowels (except in Pre-Proto-Armenian) and medially between an immediately preceding vowel and a following non-syllabic. This latter change caused the compensatory lengthening of preceding short vowels:

eHC > ēC
oHC > ōC
aHC > āC
iHC > īC
uHC > ūC

I assume that the single remaining laryngeal, **h*, was, at first, preserved in all other positions and that it had a syllabic allophone when between two non-syllabics — this may be written **h̥*. It is on the basis of the Armenian evidence that I assume this single remaining laryngeal to have been the voiceless laryngeal fricative [h]. Szemerényi (1967:89—90), Vaillant (1950:241—246), and Zgusta (1951:428—472) also agree that, in its final stage of development, Proto-Indo-European had only a single laryngeal and that that laryngeal was a voiceless laryngeal fricative. See also Collinge 1970b:67—101; Hammerich 1948; Kessler no date, p. 23.

The following table compares the symbols used in this book (1) to represent the laryngeals with the symbols used by various other scholars: (2) Kuryłowicz 1935; (3) Benveniste 1935, Watkins 2000; (4) Couvreur 1937, Messing 1947; (5) Sapir 1938, Sturtevant 1942 (note the table on p. 22); (6) Lehmann 1952; (7) Beekes 1995 and 2011, Clackson 2007, Fortson 2004 and 2010, Meier-Brügger 2003, Watkins 1998; (8) Mallory—Adams 1997; (9) Keiler 1970; (10) De Saussure 1878:

1	2	3	4	5	6	7	8	9	10
ʔ	ə̯$_1$	ə$_1$	ʾ	ʾ	ʔ	h$_1$	h$_1$	H̯$_1$	A
ħ̯h	ə̯$_2$	ə$_2$	ḥ	x	x	h$_2$	h$_2$	H̯$_2$	A
ʕ̯ɦ	ə̯$_3$	ə$_3$	ʿ	γ	γ	h$_3$	h$_3$	H̯$_3$	A
h	ə̯$_4$			ː	h		h$_4$		O̯

In closing, we may note that many of the developments posited here for the Proto-Indo-European laryngeals are similar to developments found in Coptic, as analyzed by Greenberg (1969:183—184). For more information on the Coptic developments, cf. Loprieno 1995:40—50; Peust 1999; Vergote 1945 and 1973.Ib:12—101.

4.2. THE TRADITIONAL VOICELESS ASPIRATES

According to the Neogrammarian reconstruction of the Proto-Indo-European phonological system, the stop system was characterized by a four-way contrast of (1) plain (that is, unaspirated) voiceless stops, (2) aspirated voiceless stops, (3) plain (that is, unaspirated) voiced stops, and (4) aspirated voiced stops (cf. Brugmann 1904:52 and 1905:54), thus:

1	2	3	4	
p	ph	b	bh	(bilabial)
t	th	d	dh	(dental)
k̂	k̂h	ĝ	ĝh	(palatal)
q	qh	g̑	g̑h	(pure velar)
q$^{\text{u}}$	q$^{\text{u}}$h	g̑$^{\text{u}}$	g̑$^{\text{u}}$h	(labiovelar)

The traditional voiceless aspirates (series 2 above) were originally posited by the Neogrammarians on the basis of the following correspondences from Indo-Iranian, Armenian, and Greek:

Sanskrit	Avestan	Iranian	Armenian	Greek
ph	f	f	p^h	φ
th	θ	θ	t^h	τ
kh	x	x	x	χ

In the remaining daughter languages, the traditional voiceless aspirates and plain (unaspirated) voiceless stops have the same treatment. In Slavic, there are a small number of examples in which *k^h appears to become *x. These examples are best explained as borrowings, most likely from Iranian (cf. Carlton 1991:95). In Armenian, the dental voiceless aspirate and plain voiceless dental stop have the same treatment (except after *r*), and the same appears to have also been the case in Greek, at least superficially.

Current thinking on the part of the vast majority of Indo-Europeanists is that the traditional voiceless aspirates are not to be reconstructed for the Indo-European parent language, being secondarily derived in the daughter languages, and, in a great many cases, it is clear that the reflexes found in the daughter languages can indeed be secondarily derived from earlier clusters of voiceless stop plus a following laryngeal (as first suggested in 1891 by Ferdinand de Saussure in a paper read before the Société de Linguistique de Paris [cf. de Saussure 1892 and 1922:603; Sturtevant 1942:83, §78]).

*pH	>	Sanskrit *ph*, etc.
*tH	>	Sanskrit *th*, etc.
*kH	>	Sanskrit *kh*, etc.

As far as the alleged Greek reflex of the traditional dental voiceless aspirate is concerned, we are mostly dealing, in the available Greek examples, with forms in which an earlier laryngeal did not occur in the position directly following the dental stop. In the Sanskrit cognates, on the other hand, there was an earlier laryngeal in this position, and this has left a trace in the form of aspiration. A couple of examples will illustrate the difference between Greek and Sanskrit here:

1. Greek πλατύς ‘wide, broad, flat, level’ (< Pre-Greek **pl̥tú-s*) versus Sanskrit *pṛthú-ḥ* ‘wide, broad’ (< Pre-Sanskrit **pl̥tHú-s*). There simply was no laryngeal in the Pre-Greek ancestor of the Greek form, and, hence, there is no aspiration in Greek. Cf. Burrow 1973:72.
2. Greek (Doric) ἵστᾱμι ‘I stand’ (< Pre-Greek **si-steA-mi* *[si-staA-mi]) versus Sanskrit *tíṣṭhati* ‘stands’ (< Pre-Sanskrit **(s)ti-stA-eti*). Here, Greek has full-grade of the root, and Sanskrit has zero-grade. Cf. Burrow 1973:72; Cowgill 1965:172; Sturtevant 1942:83, §78a.

There is, however, at least one example in which Greek θ corresponds to Sanskrit *th*, namely, the second singular perfect ending found, for instance, in Greek (Ϝ)οἶσ-θα ‘you know’, Sanskrit *vét-tha* ‘you know’ from earlier **-tAe* *[-tAa]. Cf. Beekes

1969:181; Cowgill 1965:171—172 and 172—173; Sturtevant 1942:46, §42f, and 83, §78a.

Unfortunately, the laryngeal explanation does not account for the origin of all examples of voiceless aspirates in the daughter languages. There are several words of onomatopoeic origin that contain reflexes of earlier voiceless aspirates. Among these are (cf. Meillet 1984:80—81):

1. Sanskrit *kákhati* 'laughs'; Armenian *xaxank^h* 'guffaw'; Greek καχάζω 'I laugh'; Old Church Slavic *xoxotъ* 'guffaw'; Latin *cachinnō* 'I laugh'.
2. Sanskrit *phŭ̃t-karoti* 'puffs, blows'; Armenian *p^{h}uk^h* 'breath, puff'; Greek φῦσα (< *φῡτι̯α) 'a pair of bellows'; Lithuanian *pũ̃sti* 'to blow (air)'; Old Church Slavic **pyxati* 'to blow' (Old Czech *puchati* 'to swell'; Polish *puchać* 'to blow'; Slovenian *púhati* 'to snort, to puff, to blow').

A laryngeal explanation is to be ruled out here. Even though laryngeals cannot account for the presence of aspiration in these forms, the treatment is identical to that occurring in the examples where the reflexes of earlier voiceless aspirates are to be derived, at the Proto-Indo-European level, from clusters of voiceless stop plus a following laryngeal.

Since there is no evidence that the traditional voiceless aspirates were involved in marking distinctive contrasts at the Proto-Indo-European level and since these sounds can be mostly secondarily derived in the Indo-European daughter languages, there is little justification for reconstructing the traditional voiceless aspirates as a separate series in the Indo-European parent language. Cf. Adrados—Bernabé—Mendoza (1995—1998.I:197—202) for similar views on the voiceless aspirates.

4.3. THE TRADITIONAL PLAIN (UNASPIRATED) VOICELESS STOPS

On the basis of the reflexes found in Sanskrit, Greek, Latin, Baltic, and Slavic, The Neogrammarians (as well as August Schleicher before them) posited a series of plain (unaspirated) voiceless stops for series 1 at the Proto-Indo-European level. The evidence of Germanic, Celtic, and Armenian (along with the poorly-attested Phrygian), however, points to the presence of aspiration in this series in Proto-Indo-European. Two explanations were available to the Neogrammarians to account for the reflexes found in the various daughter languages: (A) loss of aspiration in Sanskrit, Greek, Latin, Baltic, and Slavic or (B) secondary development of aspiration in Germanic, Celtic, Armenian, and Phrygian. The Neogrammarians chose the second alternative (cf., for example, Meillet 1967:118—119 and 1984:91—92), and this view has been followed by most scholars until fairly recently. However, the first alternative should not be so quickly dismissed. Let us take a closer look at the developments found in the daughter languages.

In Germanic, the traditional plain voiceless stops are represented by voiceless fricatives, which are assumed to have developed from earlier voiceless aspirates (cf. Meillet 1984:91; Prokosch 1939:59—60; Streitberg 1963:105—113), thus:

Traditional Indo-European		Pre-Germanic		Proto-Germanic
p	>	p^h	>	f
t	>	t^h	>	θ
$\hat{k}$	>	$\hat{k}^h$	>	χ
q	>	q^h	>	χ
$q^{\underline{u}}$	>	$q^{\underline{u}h}$	>	χw

It should be noted that the traditional voiceless stops were retained unchanged in Germanic when preceded by **s*: **sp*, **st*, **sk* > **sp*, **st*, **sk*. **t* was also retained unchanged when preceded by another voiceless stop (> fricative): **pt*, **kt* > **ft*, **χt*.

At a later date, medial (and final) **f*, **θ*, **χ*, **χw* , together with **s*, became the voiced fricatives **β*, **ð*, **γ*, **γw*, and **z* respectively except between vowels when the accent fell on the contiguous preceding syllable (Verner's Law).

In Celtic, the traditional plain voiceless stops are assumed to have developed into voiceless aspirates (Lewis—Pedersen 1937:40—48), thus:

Traditional Indo-European		Proto-Celtic
p	>	p^h
t	>	t^h
$\hat{k}$	>	$\hat{k}^h$
q	>	q^h
$q^{\underline{u}}$	>	$q^{\underline{u}h}$

The bilabial member was eventually lost (cf. Fortson 2004:275 and 2010:310; Lewis—Pedersen 1937:26—27; Morris Jones 1913:124—126), thus:

$$p^h > h > Ø$$

The Armenian developments can be explained by assuming that in Pre-Armenian Proto-Indo-European, series 1 was voiceless and aspirated, series 2 were clusters of voiceless stop plus a following laryngeal, series 3 was glottalized, and series 4 was voiced and aspirated (cf. Godel 1975:73—77; Meillet 1936:23—38):

Pre-Armenian					Armenian			
1	2	3	4		1	2	3	4
p^h	pH	p'	b^h	>	h (w, Ø)	p^h	p	b (w)
t^h	tH	t'	d^h	>	t^h	t^h	t	d
k^{yh}		k'^y	g^{yh}	>	s		c	j (z)
k^h	kH	k'	g^h	>	k^h	x	k	g (ǰ, ž)

In Armenian, some of the reflexes of series 1 merged with the reflexes of series 2. This happened in the case of the onomatopoeic terms discussed above, where, for example, earlier *p^h and *k^h became p^h and *x* respectively in Armenian as if from earlier **pH* and **kH* (this also occurred for all reflexes of series 1 in Sanskrit and Greek). In like manner, the aspiration of series 1 was preserved in Armenian after initial *s*-. *t^h and **tH* have mostly merged in Armenian, though earlier *rt^h became *rd*, while **rtH* became rt^h (cf. Meillet 1984:79).

Thus, the Germanic, Celtic, and Armenian developments can be explained by assuming that series 1 was voiceless and aspirated at the Proto-Indo-European level, that is to say, it is not necessary to posit earlier plain voiceless stops to account for the developments in these branches. Armenian is particularly important in that it has preserved the contrast between the older voiceless aspirates (series 1) and those that developed at a later date from former clusters of voiceless stop plus a following laryngeal (series 2).

In Sanskrit, Greek, Latin, Baltic, and Slavic, series 1 is represented by plain (unaspirated) voiceless stops. This, however, is not the original patterning but is, rather, an innovation. Here, Armenian provides the key to understanding the developments in these branches. On the basis of the Armenian (along with Germanic and Celtic) evidence, series 1 may be assumed to have originally been voiceless and aspirated. Furthermore, following the views of Gamkrelidze—Ivanov, it may be assumed that the aspiration was phonemically non-distinctive. There were thus two allophones, one with aspiration, and one without:

p^h	~	p
t^h	~	t
k^h	~	k
k^{wh}	~	k^w

In Sanskrit, the allophones of series 1 became phonemic — the aspirated allophones (*p^h, *t^h, *k^h, *k^{wh}) appeared in onomatopoeia and after initial *s*-, while the plain (unaspirated) allophones (*p, *t, *k, *k^w) appeared in all other environments. A few examples will illustrate the treatment of series 1 after *s*- in Sanskrit:

1. Sanskrit *sphuráti* ‘to dart, to bound, to rebound, to spring; to tremble, to throb, to quiver, to palpitate, to twitch (as nerves of the arm), to struggle’, *spharati* ‘to expand, to diffuse widely’: Armenian *$sp^hṙem$* ‘to spread, to scatter’, *p^harat* ‘scattered’.
2. Sanskrit *sthágati* ‘to cover, to hide, to conceal’: Greek στέγω (and τέγω) ‘to cover closely (so as to keep water either out or in)’; Latin *tegō* ‘to cover’.
3. Sanskrit *skhálāmi* ‘to stumble, to stick fast, to go wrong’: Armenian *sxalim* ‘to go wrong, to stumble, to err, to sin’.

Emonds (1972:120) also assumes that the voiceless aspirates found in Indic, Greek, and Armenian have developed from series 1:

> Finally, NIE [New Indo-European] allows us to view the development of the tense, voiceless aspirates in Indic and Greek in new light. I am not denying, however, that credible theories about their origin have been advanced in terms of TIE [Traditional Indo-European] (by the introduction of laryngeals, etc.). However, the presence of voiceless aspirates in NIE (the *ph*-series) suggests as one possibility an imperfect operation of LAX or Z2 in just those languages where some laxing took place, but in which all aspirated stops were not eliminated by CG. (By "imperfect operation", I mean the existence of a dialect in which the rule failed to operate, the dialect later dying out after contributing a number of "exceptions" to the previously completed historical change.)
>
> If such imperfect operation of Z2 took place, it would account for Indic and Greek *ph*'s that correspond to *p*'s in the central group and *ph*'s in Germanic… The fact that the *ph*'s and *x*'s that occur in Armenian (and Slavic) examples do not correspond to the regular development of NIE *ph* and *kh* in those languages supports the notion that "imperfect operation" of Z2 should be reinterpreted as reintroduction of words from a dialect that did not undergo Z2 (or other rules that affected Armenian and Slavic development of *ph* and *kh*).

Whereas Emonds sees the voiceless aspirated reflexes of series 1 (instead of the expected plain voiceless stops) that appear in Sanskrit, Greek, and Armenian as due to borrowings, I see them as the natural result of the phonemicization of the allophones of this series in each of these dialects themselves.

Correspondences:

Proto-Indo-European	*p^h	*t^h	*k^{yh}	*k^h	*k^{wh}
Sanskrit	p	t	ś	k c	k c
Avestan	p	t	s	k č	k č
Albanian	p	t	th s	k q	k q s
Armenian	h w Ø	t^h	s	k^h	k^h
Old Church Slavic	p	t	s	k č c	k č c
Lithuanian	p	t	š	k	k
Gothic	f b	þ d	h g	h g	hw h
Old Irish	Ø	t th	c ch	c ch	c ch
Oscan	p	t	c k	c k	p
Latin	p	t	c	c	qu c
Greek	π	τ	κ	κ	π τ κ
Tocharian	p	t c ts	k ç	k ç	ku k ç

We can now return to the question of the choices that were available to the Neogrammarians: (A) loss of aspiration in Sanskrit, Greek, Latin, Baltic, and Slavic or (B) secondary development of aspiration in Germanic, Celtic, and Armenian. In view of the theory proposed by Gamkrelidze—Ivanov, it is not so much a question of loss or retention as it is of the phonemicization and generalization of the

allophones of series 1 in the various daughter languages, though Germanic, Celtic, and Armenian come closer to the original patterning than do those daughter languages in which series 1 is represented by plain voiceless stops, since the aspirated allophones seem to have been primary at the Proto-Indo-European level. In this sense, Sanskrit, Greek, Latin, Baltic, and Slavic have innovated by generalizing the unaspirated allophones of series 1 (for details on the developments leading to loss of aspiration in these daughter languages, cf. Suzuki 1985a:285—294; see also Gamkrelidze—Ivanov 1984.I:35—80 and 1995.I:31—70).

4.4. THE TRADITIONAL VOICED ASPIRATES

According to the traditional reconstruction, series 4 is assumed to have been voiced and aspirated in Proto-Indo-European. The evidence for voicing is overwhelming (Indo-Iranian, Albanian, Armenian, Germanic, Celtic, Baltic, and Slavic), while that for aspiration is limited, coming from Indo-Aryan, Greek, Italic, and Armenian. Indeed, for this last group of languages, the assumption that this series was voiced and aspirated in their immediate ancestors is the only reasonable way to account for later developments in each of them. For the remaining daughter languages, however, it is not necessary to set up voiced aspirates in their immediate ancestors since later developments in these languages can be accounted for by setting up earlier plain (unaspirated) voiced stops. In view of these considerations, I assume that voiced aspirates appeared at a very late stage and that they arose only in the Disintegrating Indo-European dialects that developed into Indo-Iranian, Greek, Italic, and Armenian. Similar views are expressed by Kümmel 2012:304.

Gamkrelidze—Ivanov assume that series 4 was voiced and aspirated in Proto-Indo-European. They point out, however, that the feature of aspiration was phonemically irrelevant and that this series could appear either with or without aspiration depending upon the paradigmatic alternation of root morphemes. Specifically, the distributional patterning of the allophones was as follows (cf. Gamkrelidze 1976:404), though only in Indo-Iranian (Indo-Aryan) and Greek — Grassmann's Law did not operate elsewhere (cf. Hamp 1989:210—211; Hamp states that Grassmann's Law arose independently in Greek, on the one hand, and in Indic [but not Iranian], on the other, and points out that it did not occur in Armenian):

> In particular, when phonemes of [series 4] co-occurred in a root, one of the units was realized as an aspirate, the other as a non-aspirate. Thus, e.g., a root morpheme /*b^{h}eu̯d^{h}-/ would be manifested as [*beu̯d^{h}-] or [*b^{h}eu̯d-] according to the paradigmatic alternations of the morpheme. Grassmann's Law should be accordingly interpreted not as a deaspiration rule operating independently in Indo-Iranian and Greek, but as a rule of allophonic variations, still at the Proto-Indo-European level, of the phonemes of [series 4].
>
> The same assumption could easily, and in a natural way, account for the phenomena described by Bartholomae's Law. A morphemic sequence of /*b^{h}ud^{h}-/ and /*-t^{h}o-/ would be realized as [*bud^{h}-] + [*-t^{h}o-] > [*budt^{h}o-] (in

accordance with the rule of non-cooccurrence in a sequence, either distant or in contact, of two aspirated allophones), this yielding Old Indian *buddha*, by progressive assimilation on the feature of voice.

In Italic, however, the development of series 4 differs from what is found in Sanskrit and Greek. As in Greek, the voiced aspirates were, at first, devoiced, resulting in voiceless aspirates. Then, these voiceless aspirates became voiceless fricatives, thus (cf. Sihler 1995:139—141; Buck 1933:118; Palmer 1954:227—230; Lindsay 1894:279—302; Clackson—Horrocks 2007:8—9 and 50—52):

b^h	>	p^h	>	φ	>	f
d^h	>	t^h	>	θ	>	f
g^h	>	k^h	>	χ	>	h
g^{wh}	>	k^{wh}	>	$χ^w$	>	f

In Latin (but not Oscan and Umbrian), the voiceless fricatives were preserved initially, but, medially, they first developed into the corresponding voiced fricatives, which then yielded voiced stops (cf. Gamkrelidze—Ivanov 1984.I:64—65 and 1995.I:57—58).

Correspondences:

Proto-Indo-European	*b^h	*d^h	*g^{yh}	*g^h	*g^{wh}
Sanskrit	bh	dh	h	gh h	gh h
Avestan	b	d	z	g γ ǰ z	g γ ǰ z
Albanian	b	d dh	z dh d	g gj	g gj z
Armenian	b w	d	j z	g ǰ ž	g ǰ ž
Old Church Slavic	b	d	z	g ž dz	g ž dz
Lithuanian	b	d	ž	g	g
Gothic	b	d	g	g	w
Old Irish	b	d	g	g	g
Oscan	f	f	h	h	f
Latin	f b	f d	h g f	h g f	f v gu
Greek	φ	θ	χ	χ	φ θ χ
Tocharian	p	t c ts	k ç	k ç	ku k ç

4.5. THE TRADITIONAL PLAIN (UNASPIRATED) VOICED STOPS

In an important study on the hierarchical correlation of elements in a phonological system, Gamkrelidze (1978:9—46) has shown that stops and fricatives arrange themselves into definite hierarchical relationships based upon their relative frequency of occurrence. The more common, more usual, more frequent a sound,

the *less* marked it is in relationship to other sounds, which are less common, less usual, less frequent, that is, *more* marked. The various hierarchies established by Gamkrelidze were arrived at by investigating the frequency distribution of sounds in a great number of languages. These hierarchical relationships are found to be characteristic of language in general and not language specific, the underlying reasons being phonetic — the distinctive features making up the unmarked sounds simply combine with each other into simultaneous bundles more easily than do the distinctive features making up marked sounds. Finally, Gamkrelidze notes that, when there are gaps or empty slots in a system, they invariably occur at the point of articulation of the most highly marked member in the hierarchy.

Following are three of the hierarchies established by Gamkrelidze:

	Least Marked						Most Marked	
(1)	/b/	→	/p/	→	/pʰ/	→	/p’/	(bilabial)
(2)	/k’/	→	/kʰ/	→	/k/	→	/g/	(velar)
(3)	/q’/	→	/qʰ/	→	/q/	→	/ɢ/	(postvelar)

The arrows indicate the direction of greater markedness. In the first hierarchy, /b/ is the most common, most usual, most frequent, hence, least marked member; /p/ is less common than /b/ but more common than /pʰ/ and /p’/; /pʰ/ is less common than /b/ and /p/ but more common than /p’/; finally, /p’/ is the least common, hence, most marked member. Since gaps occur at the position of the mostly highly marked member, if there is a gap in this series, it will be /p’/ that will be missing. In the second hierarchy, on the other hand, the markedness relationship is reversed: /k’/ is the most common, most usual, most frequent, hence, least marked member; /kʰ/ is less common than /k’/ but more common than /k/ and /g/; /k/ is less common than /kʰ/ and /k’/ but more common than /g/; finally, /g/ is the least common, hence, most marked member. Since gaps occur at the position of the mostly highly marked member, if there is a gap in this series, it will be /g/ that will be missing here. As can be seen, the postvelar series (number 3 above) has the same markedness correlation as the velar series.

Gamkrelidze’s findings have important implications for Proto-Indo-European. As pointed out in the standard handbooks, the phoneme traditionally reconstructed as **b* was a marginal sound of extremely limited occurrence, if it even existed at all. As we have seen from the typological evidence discussed above, such a frequency distribution is not at all characteristic of /b/. Rather, the frequency distribution points to the original *non-voiced* character of this sound in Proto-Indo-European.

Further investigation reveals other anomalies in the whole series traditionally reconstructed as plain voiced stops (series 3 in the chart of the Neogrammarian reconstruction of the Proto-Indo-European stop system given above [§4.2]). First, the frequency distribution of all of the traditional plain voiced stops (**b*, **d*, **ĝ*, **g*, **g̑ʷ*) points to the non-voiced character of the entire series when viewed from a typological perspective. Next, the plain voiced stops are rarely found in inflectional endings and pronouns. Finally, two plain voiced stops could not cooccur in a root.

The frequency distribution of these sounds plus their limited role in the system in general makes the traditional reconstruction highly suspect from a typological point of view.

These are the observations that led Gamkrelidze—Ivanov, as well as Hopper, to reinterpret the traditional plain voiced stops as glottalics (ejectives). Not only does such a reinterpretation easily account for the frequency distribution of these sounds, it also explains the fact that they were used only very infrequently in inflectional affixes and pronouns, since this type of patterning is characteristic of the way ejectives behave in natural languages having such sounds. Finally, the root structure constraint against the cooccurrence of two ejectives in a root is found in a number of languages with ejectives (cf. Hopper 1973:160).

There is no uniform treatment of the ejectives in the Indo-European daughter languages. In some cases, plain voiceless stops are found, while in others, there are plain voiced stops. To understand the types of changes ejectives can undergo, the developments found in the Afrasian daughter languages may be looked at. The following developments are attested (using the dentals for purposes of illustration):

1. Deglottalization: **t' > t* (Neo-Aramaic dialect of Ṭūr-ʿAbdīn and Ancient Egyptian).
2. Voicing: **t' > *ɗ > *ḍ > d* (initially in the Southern Cushitic languages Iraqw, Burunge, Alagwa, and K'wadza and medially in the East Chadic language Tumak).
3. Retention: **t' > t'* (modern South Arabian languages and the Semitic languages of Ethiopia).
4. Pharyngealization: **t' > tˁ, dˁ* (Arabic and the Berber languages).
5. Voicing to implosive: **t' > ɗ* (Proto-Chadic and Proto-East Cushitic).
6. Voicing to retroflex: **t' > *ɗ > ḍ* (Somali).

According to Colarusso (1975:82—83 and 1981:479—480), in some dialects of the Northwest Caucasian language Abaza, plain voiced stops correspond to ejectives in Standard Abaza. Colarusso suggests that the ejectives may have passed through the following progression: glottalized > creaky voice > full voice (see also Gamkrelidze—Ivanov 1973:154). In support of this suggestion, Colarusso notes that the ejective series has creaky voicing in Kabardian. For more information on the major phonological processes involving ejectives, cf. Fallon 2002. Fallon devotes a whole chapter to a discussion of ejective voicing (Chapter 6). Here, he also provides empirical support for the Glottalic Theory of Proto-Indo-European consonantism.

The Germanic, Armenian, Tocharian, and Anatolian developments are straightforward: deglottalization. In Baltic, Slavic, Celtic, and Albanian, the glottalics merged with the traditional voiced aspirates. In Indo-Iranian, Greek, and Italic, however, the glottalics became plain voiced stops but did not merge with the voiced aspirates (that is, series 3 and 4 remained distinct in these branches). The developments in the individual daughter languages are discussed in detail in Chapter 5 of this book.

Correspondences:

Proto-Indo-European	*p’	*t’	*k’^{y}	*k’	*k’^{w}
Sanskrit	b	d	d	g j	g j
Avestan	b	d	z	g γ ǰ z	g γ ǰ z
Albanian	b	d dh	z dh d	g gj	g gj z
Armenian	p	t	c	k	k
Old Church Slavic	b	d	z	g ž dz	g ž dz
Lithuanian	b	d	ž	g	g
Gothic	p	t	k	k	q k
Old Irish	b	d	g	g	b g
Oscan	b	d	g	g	b
Latin	b	d	g	g	v gu g
Greek	β	δ	γ	γ	β δ γ
Tocharian	p	t c ts	k ç	k ç	ku k ç

As noted above, the sound traditionally reconstructed as **b* may have been non-existent in Proto-Indo-European. Under the revised interpretation, this would have been a bilabial ejective **p’*. Had this sound existed in the Indo-European parent language, it would have developed into *b* in those daughter languages that have changed the ejectives into voiced stops. In the case of Sanskrit (3rd sg.) *píbati* ‘drinks’, Latin *bibit* ‘drinks’, Old Irish *ibid* ‘drinks’, from Proto-Indo-European **p^{h}i-p^{h}ʔ-et^{h}i* (traditional **pi-pə̯$_{1}$-eti*) (cf. Gamkrelidze—Ivanov 1995.I:856), there is direct evidence for such a development. While it is common for languages having ejectives to have a gap at the point of articulation of the bilabial member, no known natural language with a voicing contrast in stops has a gap at the point of articulation of the voiced bilabial. Since the normal development of the Disintegrating Indo-European phonological system in Greek, Italic, and Indo-Iranian would have created such a gap, a voiced bilabial was introduced in these branches by various means. In Greek, the glottalized labiovelar **k’^{w}* developed into *b* (written β) under certain conditions. This is the regular development in Oscan and Umbrian. In Latin, *b* arose from medial **f* and from earlier **θ* when before or after *r*, before *l*, or after *u*. In Indo-Aryan, *b* arose from *bh* through the change described by Grassmann’s Law. Finally, the gap was also filled in all three branches through borrowings.

Under the traditional reconstruction, the Germanic and Armenian “sound shifts” are anomalous (for discussion, cf. Meillet 1967:116—124 and 1984:89—96). Nothing quite the same exists in any of the other daughter languages (except the poorly-attested Phrygian). There is, of course, Tocharian, but the changes there are different in that the opposition between the traditional plain voiceless, plain voiced, and voiced aspirated stops is completely eliminated (cf. Adams 1988:36—43; Fortson 2004:353—354 and 2010:402—404; Krause—Thomas 1960:64; Van Windekens 1976—1982.I:76), while in Germanic and Armenian, the opposition

remains intact. The Germanic and Armenian developments cannot have been due to a common innovation since there is no indication that these two branches were ever in contact. Under the new reconstruction proposed by Gamkrelidze, Hopper, and Ivanov, these branches are to be seen as relic areas. In fact, they provide a key piece of evidence in support of the Glottalic Theory.

4.6. THE GUTTURALS (TECTALS)

Pre-divisional Proto-Indo-European may be assumed to have had two types of gutturals: (A) plain velars and (B) labiovelars. The latter type was characterized by a secondary articulation of labialization that served to maximize the distinction between this series and the plain velars.

It has often been assumed that Proto-Indo-European had three guttural series: (A) palatals (palatovelars), (B) velars, and (C) labiovelars. This theory, however, needs to be reconsidered. In the first place, such a theory would force us to assume that there was a common innovation in the Proto-Indo-European antecedent of the centum languages in which the palatals merged with the velars. There is absolutely no evidence whatsoever that such a merger has taken place. Furthermore, the palatals can be shown to have become phonemic only in the Proto-Indo-European antecedent of the satəm languages (cf. Lehmann 1952:8; Meillet 1964:94—95). Finally, it is not necessary to set up a third series to account for cases in which velars in the satəm languages correspond to velars in the centum languages, since these examples can be accounted for equally well by assuming just two series (cf. Burrow 1973:76—77). This subject is discussed with great lucidity by Meillet (1894 and 1964:93—94), who notes that the cases in which velars in the centum languages correspond to velars in the satəm languages occur in certain specific environments: (A) before **a*; (B) before **r*; (C) after **s*; and (D) at the end of roots, especially after **u*. Meillet sums up his discussion of the gutturals by noting that the velars were simply preserved in certain positions and palatalized in others.

In his cross-linguistic study of palatalization, Bhat (1978:60—67) discusses palatalizing environments. He notes:

> The most prominent environment that could induce palatalization in a consonant is a following front vowel (especially the high- and mid-front unrounded vowels i and e), and a following palatal semivowel (yod). These are reported to be effective in palatalizing a preceding consonant in almost all of the languages examined by us. A following yod is more effective on apicals, whereas a following vowel, especially stressed, is more effective on velars…
>
> Velars may also be palatalized by a following low front vowel, as for example, in ENGLISH (before æ, ǣ) and in FRENCH (dialectally before a also). In RUSSIAN, all consonants were palatalized before æ… Similarly, the apicals may be palatalized by a following high back vowel or semivowel as seen in PAPAGO, TEPEHUAN, BASQUE, and others…
>
> There are only a limited number of instances in which a front vowel (or high back vowel) is reported to have palatalized a following consonant.

That is to say that, while the palatalization of *following* consonants by front vowels (or high back vowels) does in fact occur (Bhat discusses several examples), it is a far less frequently attested phenomenon than the palatalization of *preceding* consonants. Bhat (1978:66—67) also discusses the fact that certain environments may block palatalization:

> a. We have noted only two environments that could be specified as capable of blocking palatalization. They are (A) an apical trill or tap, and (2) a retroflex consonant. Both these could prevent palatalization of a velar consonant, that is, they could block the tongue fronting tendency of a given environment…
>
> b. However, in the case of apical sibilants, r appears to induce palatalization (rising)…
>
> c. There are a few additional environments that appear to block palatalization, as for example, a following uvular fricative in EASTERN ARMENIAN…, a following t or s in AKAN…, or the occurrence of initial position in AMHARIC…

Palatalization of velars is an extremely common phenomenon and can be observed in the historical development of many languages. We can take the developments in the Romance languages as an example. Classical Latin had the following gutturals:

Velars:	c, k	/k/	g	/g/
Labiovelars:	qu	/k^{w}/	gu	/g^{w}/

Somewhere around the beginning of the third century CE, /k/ and /g/ were palatalized to /k^{y}/ and /g^{y}/ respectively before, *a*, *ae*, *ē*, *i*, and *ī* (cf. Elcock 1960:53—55). /k^{y}/ and /g^{y}/ then became /t^{y}/ and /d^{y}/ respectively and then /t͡s^{y}/ and /d͡z^{y}/. /t͡s^{y}/ developed into French /s/, Spanish (Castilian) /θ/ (dialectal /s/), Portuguese /s/, Italian /t͡š/, and Romanian /t͡š/. It should be noted that Sardinian is a relic area in which /k/ and /g/ were not palatalized. /d͡z^{y}/ developed into French /ž/, Spanish /j/, Portuguese /ž/, Italian /d͡ž/, and Romanian /d͡ž/.

There has also been a general delabialization of /k^{w}/ and /g^{w}/ in the Romance languages, especially before front vowels. For details about the development of the gutturals in the Romance languages, cf. Elcock 1960:52—55; Mendeloff 1969:16—31; Posner 1996:110—115; Harris—Vincent (eds.) 1988:38—40 and 1997:38—40.

The comparative evidence allows us to reconstruct the following phonemic gutturals for Pre-divisional Proto-Indo-European:

Plain velars:	k^{h}	k’	g^{h}
Labiovelars:	k^{wh}	k’^{w}	g^{wh}

The Anatolian data — especially the Hittite data — are particularly important here. Hittite shows no trace of either palatalization of the velars or of delabialization of the labiovelars (cf. Kronasser 1956:64—68 and Sturtevant 1951:55—59, §§78—81, for examples). There is some evidence from the Luwian branch, however, that the

velars may have had non-phonemic palatalized allophones in certain environments in Proto-Anatolian (cf. Melchert 1994a:251—252 [for Luwian] and 303 [for Lycian]). That these allophones were not phonemic in Proto-Anatolian is shown by their reflexes in Hittite as opposed to Luwian. In Hittite, the gutturals have the same treatment regardless of their environment. The developments found in the Luwian branch, then, may be regarded as an innovation specific to that branch and not representative of the Proto-Anatolian situation (cf. Melchert 2017:176). On this basis, we can say with some confidence that Pre-Anatolian Proto-Indo-European had only two phonemic guttural series and that the phonemicization of a separate palatal series and the delabialization of the labiovelars must have taken place after the separation of the Anatolian languages from the main speech community.

The gutturals probably developed as follows: At an early date, possibly even before the separation of the Anatolian languages from the main speech community, the velars developed non-phonemic palatalized allophones when contiguous with front vowels as well as before **y*. At a later date, these allophones were analogically extended to the environment of apophonic **o* as well (and perhaps in some cases even to **a*). In the Disintegrating Indo-European antecedent of the satəm languages, the labiovelars were — perhaps only partially at first — delabialized. The newly delabialized labiovelars merged with the unpalatalized allophones of the plain velars. This change brought about the phonemicization of the palatalized allophones of the plain velars since both palatalized and unpalatalized velars (the latter from earlier labiovelars) were now found in the vicinity of front vowels, apophonic **o*, and **y*. Thus, the Disintegrating Indo-European antecedent of the satəm languages had the following gutturals:

Palatals (palatovelars):	k^{yh}	k'^{y}	g^{yh}
Plain velars:	k^{h}	k’	g^{h}
Labiovelars:	k^{wh}	k'^{w}	g^{wh}

These changes probably began in the Disintegrating Indo-European antecedent of Indo-Iranian and then spread outward to Pre-Baltic, Pre-Slavic, Pre-Armenian, and Pre-Albanian (cf. Szemerényi 1972a:129). The fact that the various satəm languages sometimes show a different treatment for the labiovelars as opposed to the plain velars seems to indicate that the delabialization of the labiovelars may not have been carried through to completion until after the emergence of the individual satəm daughter languages (cf. Szemerényi 1972a:128). Since the labiovelars did not become delabialized in the Disintegrating Indo-European antecedents of the centum languages, there was no impetus for the phonemicization of the palatals in these languages.

Even though the Guttural Theory outlined above cannot explain every example, it has, nevertheless, the advantage of being able to account for the greatest number of developments. Moreover, it is fully compatible with everything we know about sound change and has historically-attested parallels in natural languages. Cf. Pulju 1995:22—43, Meillet 1964:91—95 and 1967:68—73, Kuryłowicz 1971, Georgiev

1966:22—34 and 1981:41—62, Lehmann 1952:100—102 and 1993:100—101, Adrados—Bernabé—Mendoza 1995—1998.I:188—193 and 2010.I:122—128, and Woodhouse 1998 for essentially the same conclusions.

Postvelars (or uvulars) have also been posited for Proto-Indo-European by several prominent scholars, such as, for example, Normier (1977:174—175) and Gamkrelidze—Ivanov (1984.I:129—134 and 1995.I:111—114). In my opinion, these theories are not without merit. However, since I do not at present believe that there were more than three guttural series — palatovelars, plain velars and labiovelars — at any time in the prehistory of Proto-Indo-European that can be recovered by a comparison of the extant daughter languages, the postvelars, if they ever existed, must have been lost at some time well before the earliest period of Proto-Indo-European proper.

4.7. RESONANTS

Traditionally, the semivowels, liquids, and nasals are included in this class (cf. Watkins 1998:44—46). However, only the liquids and nasals will be dealt with here. The semivowels *y (*i̯*) and *w (*u̯*) will be discussed below in the section dealing with the vowels and diphthongs.

According to Brugmann (1904:52 and 109—138), the following resonants are to be reconstructed for Proto-Indo-European:

Non-syllabic:	l	r	m	n	n̂	ɒ
Syllabic:	l̥ l̥̄	r̥ r̥̄	m̥ m̥̄	n̥ n̥̄	n̥̂ n̥̂̄	ɒ̥ ɒ̥̄

The resonants could function as syllabics or non-syllabics depending upon their environment. They were non-syllabic (1) when between vowels or initially before vowels, (2) when preceded by a vowel and followed by a consonant, and (3) when preceded by a consonant and followed by a vowel.

The syllabic allophones of the resonants arose at an early stage of development within the Proto-Indo-European parent language when the stress-conditioned loss of former contiguous vowels left them between two non-syllabics:

CVRCV́ > CəRCV́ > CR̥CV́

Finally, it should be mentioned that the long syllabic resonants reconstructed by the Neogrammarians are now universally thought to have been clusters of short syllabic resonant plus laryngeal: R̥H.

For a fuller discussion of the patterning of the resonants, cf. Adrados 1975.I: 263—289; Beekes 1995:135—137; Clackson 2007:34—36; Gamkrelidze—Ivanov 1995.I:167—170; Edgerton 1943 and 1962; Fortson 2010:60—62; Horowitz 1974; Lehmann 1952:10—14; Meillet 1964:105—126; Szemerényi 1996:105—110.

Correspondences:

Proto-Indo-European	*m	*n	*l	*r
Sanskrit	m	n	r l	r
Avestan	m	n	r	r
Albanian	m	n	l	r
Armenian	m	n	l ł	r ṙ
Old Church Slavic	m	n	l	r
Lithuanian	m	n	l	r
Gothic	m -n	n	l	r
Old Irish	m	n	l	r
Oscan	m	n	l	r
Latin	m	n	l	r
Greek	μ -ν	ν	λ	ρ
Tocharian	m ṃ	n ñ ṃ	l ly	r

4.8. THE VOWELS AND DIPHTHONGS

The first attempt to reconstruct the Proto-Indo-European vowel system was made by August Schleicher. Schleicher's system was as follows (1876:11):

	Original Vowel	First Increment	Second Increment
a-grade	a	a + a = aa	a + aa = āa
i-grade	i	a + i = ai	a + ai = āi
u-grade	u	a + u = au	a + au = āu

Even though Schleicher's system, which was modeled after that of Old Indic, was able to account for many of the developments found in the daughter languages, there remained many unsolved problems, and his system did not endure the onslaughts of a series of brilliant discoveries made in the seventies of the nineteenth century by a younger generation of scholars, the so-called "Neogrammarians" (Junggrammatiker).

Perhaps the most important discovery of the Neogrammarian period was the "Law of Palatals" (cf. Collinge 1985:133—142), according to which an original **k*, for example, developed into *c* in Old Indic under the influence of a following **ĕ*, **ĭ*, or **y*. This discovery firmly established the primacy of the vowel systems found in the European daughter languages and proved that the Indo-Iranian system had resulted from an innovation in which original **ĕ*, **ŏ*, and **ă* had merged into **ă*. Also important was the demonstration by the Neogrammarians that the Indo-European parent language had syllabic liquids and nasals.

According to the Neogrammarians (cf. Brugmann 1904:52 and 66—99; Hübschmann 1885), Proto-Indo-European had the following vowel system:

Monophthongs:	e	o	a	i	u	ə		
	ē	ō	ā	ī	ū			
Diphthongs:	e̯i	o̯i	a̯i	ə̯i	e̯u	o̯u	a̯u	ə̯u
	ē̯i	ō̯i	ā̯i		ē̯u	ō̯u	ā̯u	
Semivowels:	i̯	u̯	(j ?)					

Brugmann (1904:52) also reconstructs the following syllabic liquids and nasals:

l̥	r̥	m̥	n̥	n̥̂	r̥̂
l̥̄	r̥̄	m̥̄	n̥̄	n̥̂̄	r̥̂̄

Throughout the greater part of the twentieth century, the Neogrammarian view was steadily attacked. It was dealt its first major blow in 1927 with Kuryłowicz's demonstration that one of de Saussure's "coefficients sonantiques" was preserved in Hittite. In one fell swoop, the so-called "original" long vowels (as well as the long syllabic liquids and nasals) were eliminated as was **a*, which was taken to result from **e* when next to an "*a*-coloring" laryngeal. The next to go were the diphthongs, which were reanalyzed as clusters of vowel plus non-syllabic resonant and non-syllabic resonant plus vowel (cf. Lehmann 1952:10—14). The independent status of **i* and **u* had early been questioned by Meillet (1964:118—122), who regarded them as the syllabic forms of **y* (**i̯*) and **w* (**u̯*), respectively. Finally, a strict adherence to Hirt's ablaut and accentuation theories made it possible to eliminate apophonic **o*, which was taken to result from an earlier **e* when the accent was shifted from the **e* to another syllable (cf. Burrow 1973:112—113; Hirt 1921:173—179; Lehmann 1952:109—110). By applying all of these theories, it became possible to reduce the Proto-Indo-European vowel system to a single member: **e*.

It should be made clear that this extreme view was never universally accepted. In fact, it was vigorously attacked by several scholars, including Roman Jakobson (1971[1957]:528), who soberly noted: "The one-vowel picture of Proto-Indo-European finds no support in the recorded languages of the world." See also Trubetzkoy 1969:96.

In 1967, Szemerényi, relying heavily on typological data to support his arguments, reinstated all of the vowels reconstructed by the Neogrammarians:

e	o	a	i	u	ə
ē	ō	ā	ī	ū	

Szemerényi (1967:97, fn. 91), however, ignores the diphthongs, "whose phonemic status is disputed". I fully support Szemerényi's views on the vowels and would

reconstruct an identical system for the Proto-Indo-European antecedent of the non-Anatolian daughter languages (cf. Bomhard 1979a:72).

Proto-Indo-European, as also, for example, Proto-Kartvelian, Northwest Caucasian, and Proto-Semitic, was characterized by an interchange of vocalic elements that could occur in any syllable. This interchange, which is commonly called "ablaut" or "vowel gradation", was partially correlated with the position of the accent and with distinctions between grammatical relationships (cf. Burrow 1973:108—117). The fundamental vowel was **e*, which could be changed to **o* under certain conditions. Under other conditions, however, the vowel could either be reduced or even lost altogether. Finally, the position of the fundamental vowel could change — this type of alternation is known as "Schwebeablaut" (for details, cf. Anttila 1969). An example here would be **k'en-u* 'knee' (cf. Hittite *gi-e-nu* 'knee'; Latin *genu* 'knee'), as opposed to **k'n-ew-* also 'knee' (cf. Gothic *kniu* 'knee'; Old Icelandic *kné* 'knee'; Old English *cnēo* 'knee'; Old Frisian *kniu*, *knē*, *knī* 'knee'; Old Saxon *knio* 'knee'; Old High German *kneo*, *knio* 'knee').

Several gradation series are traditionally distinguished, and the general scheme may be represented as follows (cf. Beekes 1995:164—167; Brugmann 1904:138—150; Buck 1933:106—117; Clackson 2007:71—75; Fortson 2004:73—76 and 2010:79—83; Hirt 1900 and 1921; Hübschmann 1885:71—180; Kuryłowicz 1956 and 1968:199—333; Meier-Brügger 2003:144—152; Meillet 1964:153—168; Sihler 1995:108—135; Szemerényi 1996:83—93; Watkins 1998:51—53):

I. Short Vowel Gradation:

	Lengthened-Grade	Normal-Grade	Reduced-Grade	Zero-Grade
A.	ē ~ ō	e ~ o	ə	Ø
B.	ēy ~ ōy	ey ~ oy	i, əyV (> iyV)	y
	ēw ~ ōw	ew ~ ow	u, əwV (> uwV)	w
	ēm ~ ōm	em ~ om	m̥, əmV (m̥mV)	m
	ēn ~ ōn	en ~ on	n̥, ənV (n̥nV)	n
	ēl ~ ōl	el ~ ol	l̥, əlV (l̥lV)	l
	ēr ~ ōr	er ~ or	r̥, ərV (r̥rV)	r
C.		a ~ o	ə	Ø
D.		ay	i, əyV (> iyV)	y
		aw	u, əwV (> uwV)	w

II. Long Vowel Gradation:

E.	ē ~ ō	h̥
F.	ō	h̥
G.	ā ~ ō	h̥

The most common vowel was **e*, and the most common gradation pattern was the **e* ~ **o* contrast. The vowel **a* was of relatively low statistical frequency and, at

least according to Meillet (1964:154), did not take part in the regular gradation patterning. It should be pointed out, however, that several rare examples of an **a* ~ **o* contrast are attested in the non-Anatolian daughter languages, one probable example being:

Greek ἄγω ‘to lead, to carry, to convey, to bring’
ὄγμος ‘any straight line: a furrow, path, etc.’

Colarusso (1981:499) has astutely observed: “…the PIE vowel system **e* ~ **o* is typologically utterly bizarre. Even adding **a* to this system does not change this fact.” Perhaps the most typologically unusual thing about the Proto-Indo-European vowel system as traditionally reconstructed is indeed the great importance of the **e* ~ **o* ablaut and the concomitant marginality of **a*. Adding laryngeals only makes the system even more unusual since **a* then becomes mostly (but not in every case!) a positional variant of **e*. Rather, we would expect the relationship to be reversed. All languages surveyed by Crothers (1978:93—152) have the vowel /a/, and this vowel is consistently characterized by a high frequency of occurrence (cf., for example, the frequency counts given in Greenberg 1966a:18—19). Moreover, in the Kartvelian languages, Northwest Caucasian languages, and Semitic languages, which also exhibit ablaut either as an active process or as a relic of an earlier, fully functioning ablaut process, the vowel /a/ is an integral part of the ablaut system (cf. Gamkrelidze 1966:80—81 for Kartvelian, Colarusso 1981:499—502 for Northwest Caucasian, and Kuryłowicz 1962 for Semitic). Clearly, if typological evidence is to have any meaning, there is something wrong with the traditional reconstruction of the Proto-Indo-European vowel system. Yet, if the Comparative Method is to have any validity, there must be some truth to that reconstruction.

This seeming conflict can be resolved quite easily, I believe. We can consider the traditional reconstruction to be mainly correct, but only for that form of Proto-Indo-European spoken immediately prior to the emergence of the non-Anatolian daughter languages, that is, what I call “Disintegrating Indo-European”. The vowel system of this form of Proto-Indo-European is by no means ancient and is the end product of a long, complicated evolution.

The earliest Proto-Indo-European vowel system may have been as follows:

Vowels:	i (~ e)		u (~ o)		
		e	o		
		(ə ~) a			
Also the sequences:	iy (~ ey)	uy (~ oy)	ey	oy	(əy ~) ay
	iw (~ ew)	uw (~ ow)	ew	ow	(əw ~) aw

I follow Pulleyblank (1965a:86—101) in his reinterpretation of the **e* ~ **o* ablaut of traditional Proto-Indo-European as an **ə* ~ **a* ablaut. Pulleyblank mentions that a similar ablaut pattern exists in Kabardian. Colarusso (1981:499—501) proposes a

similar interpretation and also discusses possible typological parallels with the Northwest Caucasian languages.

According to Hirt (1921:172—199) and those who follow his theories (Burrow and Lehmann, for example), the oldest ablaut alternation was the full-grade ~ zero-grade contrast. This alternation is assumed to have arisen at a time when the Proto-Indo-European phonological system was characterized by a strong stress accent. This accent caused the weakening and loss of the vowels of unstressed syllables. This period may be called the Phonemic Stress Stage of Proto-Indo-European (cf. Lehmann 1952:111—112). At a later date, stress became phonemically non-distinctive, and Proto-Indo-European was characterized by an accent system based on pitch. This period may be called the Phonemic Pitch Stage of Proto-Indo-European (cf. Lehmann 1952:109—110). It was supposedly during this period that the **e* ~ **o* contrast came into being. **e* is assumed to have been changed to **o* when the accent was shifted from the **e* to another syllable. These theories find support in the fact that the position of the accent is partially correlated with ablaut patterning in both Greek and Old Indic. Counter-examples are usually explained as due to analogical developments or as later forms that came into being after the accent lost its ability to influence the vowels (cf. Burrow 1973:112).

Though Kuryłowicz originally adhered to Hirt's theories as well, he later (1956:36—96 and 1964b:52) tried to show that the **e* ~ **o* contrast existed prior to the development of the full-grade ~ zero-grade contrast. Kuryłowicz argues that the numerous counter-examples with accented **o* indicate that qualitative ablaut was a morphological device in its own right and only superficially connected with the positioning of the accent. Moreover, he notes that, while vowel weakening and loss are closely tied to the accent, a change in vowel quality is primarily due to the environment — in other words, there is no cause-and-effect relationship between qualitative ablaut and accentuation. These are convincing arguments and are the primary basis for my belief that qualitative ablaut existed at the earliest reconstructable period of Proto-Indo-European. Moreover, Kuryłowicz's views find support in the data from the other Nostratic languages (note here especially Greenberg 1990a:125: "… the Indo-European *e*:*o* (i.e. *e*:*a*) Ablaut is very old and is part of a larger system of alternations which has correspondences in a number of other branches of Eurasiatic").

The development of **ə* into **e*, which must have occurred fairly early since it is already found in Hittite, is relatively easy to explain: **e* was the normal allophone of **ə* under stress. John Colarusso (personal correspondence) has informed me of a similar development in Ubykh and Circassian, where accented /ə/ > [e].

We may assume that **a* had a rounded allophone in certain phonetic environments (cf. Colarusso 1981:500), perhaps next to labiovelars as well as when next to **w*. In late Disintegrating Indo-European, these allophones were reapportioned, and apophonic **a* was rephonemicized as **o*. That this is an extremely late development is shown (A) by the fact that it had not yet occurred in the Anatolian languages and (B) by the widespread tendency of **a* and **o* to have identical reflexes in several of the non-Anatolian daughter languages. No doubt, the phonemicization of apophonic **o* was facilitated by the presence of non-apophonic

**o* in the system. This does not mean, however, that **a* was totally eliminated. In fact, the vowel **a* must be reconstructed as an independent phoneme distinct form **o* for Disintegrating Indo-European (cf. Szemerényi 1964a:2—9, 1967:83—84, and 1996:135—136). Disintegrating Indo-European **a* had several sources: First, it arose from the lowering and coloring of **e* (< **ə́*) when next to *a*-coloring laryngeals. Next, it was found in a small number of relic forms that somehow escaped conversion to the regular **e* ~ **o* ablaut patterning. Finally, in was retained in loanwords from other languages. (Cf. Kümmel 2012:306—310 for a somewhat different approach.)

The origin of the Proto-Indo-European long vowels has always been enigmatic. Many theories have been proposed, none of which has been completely convincing. One thing seems certain, though: the long vowels developed over a long period of time and had several causes.

The evidence for the existence of original long vowels is meager at best, and there seems little reason to suppose that long vowels existed in Pre-Proto-Indo-European. Rather, long vowels may be assumed to have arisen solely in Proto-Indo-European proper. First, long vowels arose from the contraction of two short vowels. Though probably not frequent in the earlier stages of development, contraction became increasingly important, especially in the later stages of the Indo-European parent language and the earlier stages of the non-Anatolian daughter languages, when the upheavals caused by the loss of whole classes of phonemes — such as the laryngeals, for example — often brought two or more previously separated vowels into contact. Long vowels also arose from the monophthongization of diphthongs and from the lengthening of short vowels to compensate for the loss of a following phoneme. The most important cause of compensatory lengthening was the loss of preconsonantal laryngeals after short vowels in Disintegrating Indo-European. Finally, long vowels arose by means of the analogical process known as “vṛddhi” (cf. Burrow 1973:199—291; Kuryłowicz 1968:298—307).

In reconstructing the Proto-Indo-European phonological system, the vowels **i* and **u* are usually treated as allophones of **y* (**i̯*) and **w* (**u̯*) respectively and are classed with the resonants **m*/**m̥*, **n*/**n̥*, **l*/**l̥*, **r*/**r̥* (cf. Lehmann 1952:10—14; Meillet 1964:105—126). However, as pointed out by Szemerényi (1967:82), the patterning of these sounds is not entirely parallel. For the earliest form of Proto-Indo-European, **i* and **u* should, in fact, be considered as independent phonemic entities and should be classed with the vowels rather than the resonants. The glides **y* and **w* should also be considered as independent phonemes during the early stages of development within Proto-Indo-European. At a later date, however, after various sound changes had taken place, the patterning had been modified in such a way that **i* ~ **y* and **u* ~ **w* were mostly in complementary distribution. Cf. Schmitt-Brandt 1973:79—91; Gamkrelidze—Ivanov 1984.I:160—161 and 1995.I: 137—138; Szemerényi 1996:136. As further noted by Gamkrelidze—Ivanov (1984.I:164—165 and 1995.I:141—142), the changes alluded to above brought about a major restructuring of the functional role of the high vowels **i* and **u* (this version differs slightly from the English translation made by Johanna Nichols — here, the term “resonant” has been substituted for “sonant” [Russian сонант]):

These phonetic and phonemic changes inevitably led to a split of the consonants into consonants proper and resonants (*i̯*, *u̯*, *r*, *l*, *m*, *n*). The resonants had syllabic and non-syllabic allophones depending on context, while the consonants proper had only non-syllabic allophones (and the vowels were exclusively syllabic in all positions). Consequently, resonants had the feature value [±syllabic], in contrast to consonants proper [-syllabic] and vowels [+syllabic].

These changes produced a major restructuring of the vowel system. The original high vowels *i* and *u* became identified with the syllabic allophones of *i̯* and *u̯*. Hence, they acquired the status of resonants, specifically, the syllabic allophones of resonants. These vowels had not formerly been in alternation with non-syllabic elements but were now pulled into the system of resonant alternations, which severed their connection to the class of vowels.

This reanalysis of original *i* and *u* led, in some cases, to secondary full-grade formations, with *V* being inserted into roots in which *i* or *u* had originally been root vowels but which were now interpreted as zero-grade resonants. This apparently took place in the parallel markers of the Indo-European locative *-*i*/*-*ei̯*. Of the two locative forms, the stressed *-*i* is clearly the older and reflects the ancient full-grade vowel **i*: Gk. ποδ-ί, Skt. *pad-í* 'in the foot', *dat-í* 'in the tooth', *janas-í* 'in birth', Hitt. *nepiš-i* 'in the sky', beside the later Slavic *nebes-i* 'in the sky'. Other full-grade forms in which the diphthongs *ei̯* and *eu̯* correspond to *i* and *u* in the zero-grade, often adduced as illustration of the full-grade ~ zero-grade alternation, may well represent later formations from roots with original **i* and **u* which were secondarily identified with syllabic resonants and reinterpreted as zero-grade.

According to the traditional reconstruction, Proto-Indo-European is assumed to have had the following short diphthongs:

ei̯	oi̯	ai̯	əi̯
eu̯	ou̯	au̯	əu̯

In the reduced-grade, the semivowels alone appear:

i
u

Szemerényi (1990:148 and 1996:141) notes that, while this looks good on paper, it is difficult to imagine the process that would have led to **i* and **u* in the reduced-grade. He points out that it most certainly could not have been due to a simple loss of **e*, **o*, and **a*. The actual process leading to the appearance of **i* and **u* in the reduced-grade was probably along the following lines:

A. After phonemicization of a strong stress accent, stress-conditioned weakening of the vowel to **ə* in unstressed syllables.
B. Assimilation of **ə* to **i* before **y* and to **u* before **w*.
C. Passage of **iy* to **ī* and of **uw* to **ū*.

D. Shortening of *$\bar{\imath}$ to *i and of *$\bar{u}$ to *u, thus:

A		B		C		D
əyC	>	iyC	>	īC	>	iC
əwC	>	uwC	>	ūC	>	uC

A typological parallel exists in Riffian Berber, where *itawi-d* 'he brings' developed from earlier **yəttawəy-dd*, with both **yə* and **əy* > *i* (cf. Kossmann 2012:28). The same development may be observed in Kabardian (cf. Chirikba 1996a:52).

This is only part of the story, however, since it focuses primarily on the developments affecting the Pre-Proto-Indo-European **əy* ~ **ay* and **əw* ~ **aw*. Pre-Proto-Indo-European also had the following sequences: **iy* ~ **ey*, **uy* ~ **oy*, **iw* ~ **ew*, and **uw* ~ **ow*, and these need to be considered as well. A summary of the developments is given below (only the beginning and end points are shown):

əyC	>	eyC	when stressed
əyC	>	ayC	when stressed and preceded by an *a*-coloring laryngeal
əyV	>	eyV	when stressed
əyV	>	ayV	when stressed and preceded by an *a*-coloring laryngeal
əyC	>	iC	when unstressed
əyV	>	iyV	when unstressed
ayC	>	oyC	when stressed
ayV	>	oyV	when stressed
ayC	>	iC	when unstressed
ayV	>	iyV	when unstressed
iyC	>	īC	when stressed
iyC	>	ēC	when stressed and preceded by an *a*-coloring laryngeal
iyV	>	iyV	when stressed
iyV	>	eyV	when stressed and preceded by an *a*-coloring laryngeal
iyC	>	iC	when unstressed
iyV	>	iyV	when unstressed
eyC	>	ēC	when stressed
eyV	>	eyV	when stressed
eyC	>	iC	when unstressed
eyV	>	iyV	when unstressed
uyC	>	īC ?	when stressed
uyC	>	ēC ?	when stressed and preceded by an *a*-coloring laryngeal
uyV	>	iyV ?	when stressed
uyV	>	eyV ?	when stressed and preceded by an *a*-coloring laryngeal
uyC	>	iC	when unstressed

uyV	>	iyV	when unstressed
oyC	>	oyC	when stressed
oyV	>	oyV	when stressed
oyC	>	iC	when unstressed
oyV	>	iyV	when unstressed
əwC	>	ewC	when stressed
əwC	>	awC	when stressed and preceded by an *a*-coloring laryngeal
əwV	>	ewV	when stressed
əwV	>	awV	when stressed and preceded by an *a*-coloring laryngeal
əwC	>	uC	when unstressed
əwV	>	uwV	when unstressed
awC	>	owC	when stressed
awV	>	owV	when stressed
awC	>	uC	when unstressed
awV	>	uwV	when unstressed
uwC	>	ūC	when stressed
uwC	>	ōC	when stressed and preceded by an *a*-coloring laryngeal
uwV	>	uwV	when stressed
uwV	>	owV	when stressed and preceded by an *a*-coloring laryngeal
uwC	>	uC	when unstressed
uwV	>	uwV	when unstressed
owC	>	ōC	when stressed
owV	>	owV	when stressed
owC	>	uC	when unstressed
owV	>	uwV	when unstressed
iwC	>	ūC ?	when stressed
iwC	>	ōC ?	when stressed and preceded by an *a*-coloring laryngeal
iwV	>	uwV ?	when stressed
iwV	>	owV ?	when stressed and preceded by an *a*-coloring laryngeal
iwC	>	uC	when unstressed
iwV	>	uwV	when unstressed
ewC	>	ewC	when stressed
ewV	>	ewV	when stressed
ewC	>	uC	when unstressed
ewV	>	uwV	when unstressed

In addition to the sequences of vowel plus **y* and **w*, the earliest form of Proto-Indo-European also had sequences of **y* and **w* plus vowel. In unstressed positions, the vowel was first reduced to **ə*. **ə* was then assimilated to **i* after **y*,

and the preceding **y* was lost, while after **w*, it was assimilated to **u*, and the preceding **w* was lost:

yəC	>	yiC	>	iC
wəC	>	wuC	>	uC

The vowels **i* and **u* were converted into the corresponding glides **y* and **w* respectively when directly followed by another vowel:

iV	>	yV
uV	>	wV

In a 1967 book devoted to the study of the Indo-European vowel system, Robert Schmitt-Brandt (1967:8—31 [2nd edition 1973]) concludes that it is necessary to assume a fundamental form in **i* and **u* for certain kinds of roots in Proto-Indo-European and to view the full-grade forms as secondary. This conclusion is reached on the basis of the observation that, as a general rule, when diphthongs are "reduced", long monophthongs result and not, as traditionally assumed, short monophthongs. Support for this conclusion is to be found in root-nouns, which appear in the reduced-grade (Schmitt-Brandt cites **dik̂-*, **wik̂-*, and **duk-* [I would write **t'ikʰ-*, **wikʰ-*, and **t'ukʰ-*] as examples), this being their original form. To have it the other way around, with **ey*, **ew*, etc. as the original forms, would lead, in his opinion, to reduced-grade forms with **ī* and **ū*: **deyk̂-* > **dīk̂-*, **weyk̂-* > **wīk̂-*, and **dewk-* > **dūk-*, etc. Schmitt-Brandt thus posits **i* and **u* as independent vowels in Proto-Indo-European and explains the full-grade forms in **ey*, **ew*, etc. as due to analogy. Finally, Schmitt-Brandt (1967:79—91) explains that, in an earlier period of Proto-Indo-European, **y* and **w* (he writes **i̯* and **u̯*) were consonants in their own right and were not connected with the independent vowels **i* and **u*. Somewhat similar views are expressed by William F. Wyatt (1970:58 and fn. 24).

The parts of Schmitt-Brandt's theories outlined in the preceding paragraph make a lot of sense, at least on the surface. Other parts of his theories, however, have purposely been left out of the discussion since, at least in my opinion, they are less convincing (see here the review of Schmitt-Brandt's book by Kuryłowicz 1969:41—49). What Schmitt-Brandt has correctly identified is the fact that, in certain specific instances, it is necessary to assume secondary full-grade forms. Schmitt-Brandt is also correct in seeing the vowels **i* and **u* as independent phonemic entities at an early stage of development within Proto-Indo-European. Where his theories are mistaken, however, is in the assumption that the reduction of diphthongs can only lead to long monophthongs. While this is indeed a very common development, it is not the only possible outcome. Here, we can cite developments in the Romance languages: Classical Latin had both long vowels and short vowels along with three diphthongs, namely, *ae*, *oe* and *au*. In Vulgar Latin, length distinctions were lost, and the earlier long vowels were realized as closed vowels, while the earlier short vowels were realized as open vowels. At the same

time, *ae* > open *e* [ę], *oe* > closed *e* [ẹ], and *au* > closed *o* [ọ] (though there is actually a great deal of variation in the development of *au*). In Balkan Romance, unstressed front vowels merged into [e], and unstressed back vowels merged into [u], except for [a] and [į] (closed [i] < Classical Latin *ī*), which remained intact. (Cf. Mendeloff 1969:4—16 for details about the development of the vowels and diphthongs in the Romance languages.) Another problem with Schmitt-Brandt's theories concerns the failure to recognize the fact that the latest period of Proto-Indo-European contained the remnants of multiple successive earlier periods of development. The reduction of diphthongs in unaccented syllables had a different outcome in the earliest period than in later periods — in the earliest period, short monophthongs resulted from the stress-conditioned weakening of diphthongs in unstressed syllables, while in later periods, when stress was no longer phonemically distinctive, long monophthongs resulted.

In Post-Anatolian Proto-Indo-European, secondary diphthongs arose as follows: By this time, the **e* ~ **o* ablaut patterning had assumed an important role in the emerging morphological system of Proto-Indo-European — all of the older non-Anatolian daughter languages attest to this. In order to bring stems such as **t'ik^h-*, **wik^h-*, and **t'uk^h-* (traditional **dik̂-*, **wik̂-*, and **duk-*), and the like into line with the regular **e* ~ **o* ablaut patterning, **e* and **o* were inserted before accented **i* and **u*, thus creating secondary diphthongs:

Ø > *e* and *o* /___ { í, ú } in **t'ík^h-*, **wík^h-*, **t'úk^h-*, yielding **t'éyk^h-*, **wéyk^h-*, **t'éwk^h-*, etc.

The development of secondary diphthongs was restricted to certain specific grammatical environments (such as the singular indicative verbal forms) — that is to say, not every accented **í* and **ú* was affected (cf., for example, forms such as Sanskrit nom. sg. *agní-ḥ* 'fire' and *sūnú-ḥ* 'son' or Hittite nom. sg. *šal-li-iš* 'glorious' and *a-aš-šu-uš* 'good', which must always have had **í* and **ú*). We may note at this point that secondary full-grade forms could also be created from syllabic resonant stems when the accent was shifted to the stem from another syllable (**Cḿ̥-* > **Cém-*, **Cń̥-* > **Cén-*, **Cĺ̥-* > **Cél-*, **Cŕ̥-* > **Cér-*).

The picture is still not complete, though, for we must also consider how laryngeals fit into the picture: The loss of laryngeals in sequences such as **eHiC*, **eHuC*, and the like resulted in short diphthongs when accented (**éHiC* > **eyC* and **éHuC* > **ewC*, etc.) — the preceding vowel was definitely not lengthened — but long monophthongs when unaccented (**əHiC* > **əyC* > **iyC* > **īC* and **əHuC* > **əwC* > **uwC* > **ūC*, etc.). Since these changes were later than the changes previously described and since stress was no longer phonemically distinctive, the resulting long monophthongs were not shortened to **i* and **u* respectively. In sequences such as **eHa^{x}C* and the like, the loss of the intervocalic laryngeal first produced a sequence of two short vowels. These vowels were then contracted to form a long vowel: **eHa^{x}C* > **ea^{x}C* > **ēC*, **oHa^{x}C* > **oa^{x}C* > **ōC*, **aHa^{x}C* > **aa^{x}C* > **āC*.

We may close this section by mentioning one last point. The numerous cases of vṛddhied stems in the non-Anatolian daughter languages — especially Old Indic — appear to represent a contamination of types **CḗC*- and **CṓC*- with types **CeyV*-/**CoyV*- and **CewV*-/**CowV*-, producing the new types **CḗyV*-/**CṓyV*- and **CḗwV*-/**CṓwV*- (cf. Schmalstieg 1973b:108).

4.9. ACCENTUATION AND ABLAUT IN PROTO-INDO-EUROPEAN

Disintegrating Indo-European was a *stress-accent* language (for details on accentuation in Proto-Indo-European, cf. Adrados 1975.I:311—323; Bubenik 1979:90—106; Burrow 1973:113—117; Fortson 2010:68; Hirt 1895; Halle—Kiparsky 1977:209—238; Lubotsky 1988; Meier-Brügger 2003:152—158; Meillet 1964:140—143; Sihler 1995:233—234; Szemerényi 1996:73—82; for a good general discussion of stress and *stress-accent* systems, cf. Hyman 1975:204—212, especially p. 207, and for *pitch-accent* systems, pp. 230—233). Correlating with the stress was changing pitch: rising from an unstressed syllable to a stressed syllable and falling from a stressed syllable to an unstressed syllable. Every word, except when used clitically, bore an accent. However, each word had only one accented syllable. (It should be noted here that there was a rule by which the surface accent appeared on the leftmost syllable when more than one inherently accented syllable existed in a word [cf. Lundquist—Yates 2018:2125].) The position of the accent was morphologically conditioned, accentuation being one of the means by which Proto-Indo-European distinguished grammatical relationships. Though originally not restricted to a particular syllable, there was a tendency to level out the paradigm and fix the position of the accent on the same syllable throughout (cf. Adrados 1975.I:317; Kuryłowicz 1964a:207—208). This tendency began in Disintegrating Indo-European and continued into the individual non-Anatolian daughter languages. Therefore, the Disintegrating Indo-European system is only imperfectly preserved in even the most conservative of the daughter languages, Vedic Sanskrit.

Fortson (2010:119—122) recognizes four distinct types of athematic stems in later (pre-divisional or "Disintegrating") Proto-Indo-European, determined by the position of the accent as well as the position of the full-grade (or lengthened-grade) vowel (Fortson notes that additional types developed in individual daughter languages) (see also Watkins 1998:61—62; Beekes 1985:1 and 1995:174—176):

1. Acrostatic: fixed accent on the stem throughout the paradigm, but with ablaut changes between the strong and weak cases.
2. Proterokinetic (or proterodynamic): the stem is accented and in full-grade vowel in the strong cases, but both accent and full-grade vowel are shifted to the suffix in the weak cases.
3. Amphikinetic (or holokinetic or amphidynamic): the stem is accented in the strong cases, while the case ending is accented in the weak cases. Typically, the suffix is characterized by a lengthened *o*-grade vowel in the nominative singular and a short *o*-grade vowel in the accusative singular.

4. Hysterokinetic (or hysterodynamic): the suffix is accented in the strong cases, and the case ending in the weak.

Szemerényi (1996:162) adds a fifth type:

5. Mesostatic: the accent is on the suffix throughout the paradigm.

An even more elaborate system is set up by Meier-Brügger (2003:205—218).

The rules governing the position of the accent in early Disintegrating Indo-European may be stated rather simply (this was later replaced by the more elaborate system just described):

1. Neuter action nouns were accented on the stem in the so-called "strong" cases but on the ending in the so-called "weak" cases (cf. Burrow 1973:220—226).
2. Common gender agent noun/adjectives were accented on the suffix throughout the paradigm (cf. Burrow 1973:119).
3. Athematic verbs were accented on the stem in the singular but on the ending in the plural (and dual) in the indicative but on the ending throughout the middle (cf. Burrow 1973:303).

The thematic formations require special comment. It seems that thematic agent noun/adjectives were originally accented on the ending in the strong cases and on the stem in the weak cases. This pattern is the exact opposite of what is found in the neuter action nouns. The original form of the nominative singular consisted of the accented thematic vowel alone. It is this ending that is still found in the vocative singular in the daughter languages and in relic forms such as the word for the number 'five', **pʰenkʷʰe* (**peɒqu̯e* in Brugmann's transcription). The nominative singular in **-os* is a later formation and has the same origin as the genitive singular (cf. Szemerényi 1972a:156; Van Wijk 1902).

The system of accentuation found in Disintegrating Indo-European was by no means ancient. The earliest period of Proto-Indo-European that can be reconstructed appears to have been characterized by a strong stress accent (cf. Burrow 1973:108—112; Lehmann 1952:111—112, §15.4, and 1993:131—132; Szemerényi 1996:111—113) — following Lehmann, this period may be called the Phonemic Stress Stage. This accent caused the weakening and/or loss of the vowels of unaccented syllables. There was a contrast between those syllables with stress and those syllables without stress. Stress was used as an internal grammatical morpheme, the stressed syllable being the morphologically distinctive syllable. The phonemicization of a strong stress accent in Early Proto-Indo-European caused a major restructuring of the inherited vowel system and brought about the development of syllabic liquids and nasals (cf. Lehmann 1993:138).

In the latest period of Proto-Indo-European, quantitative ablaut was no longer a productive process. Had there been a strong stress accent at this time, each Proto-Indo-European word could have had only one syllable with full-grade vowel, the vowels of the unstressed syllables having all been eliminated. However, since the

majority of reconstructed Proto-Indo-European words have more than one full-grade vowel, the stress accent must have become non-distinctive at some point prior to the latest stage of development.

TO SUMMARIZE: The earliest form of Proto-Indo-European was characterized by a system of vowel gradation in which the normal-grade contrasted with either the reduced-grade or the zero-grade (the choice between the reduced-grade on the one hand or the zero-grade on the other depended upon the relationship of the unstressed syllable to the stressed syllable — functionally, reduced-grade and zero-grade were equivalent). The normal-grade was found in all strongly stressed, morphologically significant syllables, while the reduced-grade or zero-grade were found in all syllables that were morphologically non-distinctive and, therefore, unstressed. The lengthened-grade was a later development and was functionally equivalent to the normal-grade. During the Phonemic Stress Stage of Proto-Indo-European, the basic rule was that no more than one morpheme could have a full-grade vowel in a given polymorphic form, the other morphemes in the syntagmatic sequence being in either zero-grade or reduced-grade.

Proto-Indo-European also made extensive use of inflectional endings as a means to indicate grammatical relationships. The rule that no more than one morpheme could have a full-grade vowel in a given polymorphic form must have caused conflicts between the system of indicating grammatical relationships based upon the positioning of the accent versus that based upon the use of inflectional endings. In other words, it must often have happened that more than one syllable of a word was considered morphologically significant. For example, according to the rules of derivation and inflection, the initial syllable of a word may have received the stress. At the same time, an inflectional ending may have been added, and this ending, in order not to be morphologically ambiguous may also have had a full-grade vowel in addition to that found in the stressed syllable. By the same token, when the shift of accent from, say, the stem to the ending would have produced unpronounceable consonant clusters, the vowel of the stem was retained.

It is likely that the Proto-Indo-European stress was pronounced with special intonations that helped make the accented syllable more discernable. When words with more than one full-grade vowel came into being, stress ceased to be phonemically distinctive. Phonemic pitch then replaced stress as the primary suprasegmental indicator of morphologically distinctive syllables (cf. Burrow 1973:112—113; Lehmann 1952:109—110, §1.53 and 1993:132 and 139), and the accent lost its ability to weaken and/or eliminate the vowels of unaccented syllables — following Lehmann, this period may be called the Phonemic Pitch Stage. The primary contrast was then between morphologically distinctive syllables with full-grade vowel and high pitch and morphologically non-distinctive syllables with full-grade vowel and low pitch.

Concurrent with the morphologically-conditioned development of the system of vowel gradation, another method of indicating grammatical relationships was developing, that being the use of inflectional endings. Some of these markers were inherited by Pre-Proto-Indo-European (for remarks on the prehistoric development

of these markers, see Chapter 20), while others — the majority — arose after Proto-Indo-European had assumed its own independent identity (cf. Blažek 2014). No doubt, the phonemicization of a strong stress accent and the rule that no more than one morpheme could have a full-grade vowel in a given polymorphic form must have wrecked havoc with the original system. Gradually, the vast majority of the earlier markers were replaced by newer forms, and the use of inflectional endings became the primary means of indicating grammatical relationships, with the result that vowel gradation and accentuation became mostly unnecessary and redundant features. It was not long before the earlier system of vowel gradation began to break down as analogical leveling took place. Also, in its later stages, Proto-Indo-European, as well as the individual daughter languages, it may be noted, continued to create new formations that, unlike older formations, were not affected by the causes of vowel gradation. Therefore, the patterns of vowel gradation are only imperfectly preserved in the final stage of the Indo-European parent language and in the daughter languages.

4.10. ROOT STRUCTURE PATTERNING IN PROTO-INDO-EUROPEAN

Before beginning, it is necessary to define several key terms. A “root” may be defined as the base form of a word. It carries the basic meaning, and it cannot be further analyzed without loss of identity (cf. Crystal 2003:402). A “stem”, on the other hand, may be defined as an inflectional base. A stem may or may not be coequal with a root. Cf. Crystal 2003:433.

There have been several attempts to formulate the rules governing the structural patterning of roots in Proto-Indo-European. Without going into details, it may simply be noted that none of the proposals advanced to date has escaped criticism, including the theories of Émile Benveniste (1935:147—173, especially pp. 170—171). The problem is complicated by the fact that the form of Proto-Indo-European traditionally reconstructed — what I call “Disintegrating Indo-European” — is the product of a very long, complicated evolution. As already noted, Disintegrating Indo-European contained the remnants of earlier successive periods of development.

For Disintegrating Indo-European, Jerzy Kuryłowicz’s (1935:121) description is adequate:

> … the root is the part of the word (it is a question of only the simple word) made up of (1) the initial consonant or consonantal group, (2) the fundamental vowel, (3) the final consonant or consonantal group. — The final group can consist of no more than two consonantal elements, the first of which has greater syllabicity than the second. In other words, the first consonantal element is *i̯*, *u̯*, *r*, *l*, *n*, *m*, while the second is a consonant in the strictest sense of the term: stop, *s*, or laryngeal (*ə₁*, *ə₂*, *ə₃*).

A careful analysis of the root structure patterning led Benveniste to the discovery of the basic laws governing that patterning. According to Benveniste (1935:170—171), these laws may be stated as follows (see also Lehmann 1952:17—18):

1. The Indo-European root is monosyllabic, composed of the fundamental vowel *ĕ* between two different consonants.
2. In this constant scheme: consonant plus *e* plus consonant, the consonants can be of any order provided that they are different: however, the cooccurrence of both a voiceless stop and an aspirated voiced stop is forbidden.
3. The addition of a suffix to the root gives rise to two alternating stem types: Type I: root in full grade and accented, suffix in zero-grade; Type II: root in zero-grade, suffix in full-grade and accented.
4. A single determinative can be added to the suffix, either after the suffix of stem Type II, or, if *n*, inserted between the root element and the suffix of stem Type II.
5. Further addition of determinatives or suffixes points to a nominal stem.

Benveniste's views are not necessarily incompatible with those of Kuryłowicz. These theories can be reconciled by assuming that they describe the root structure patterning at different chronological stages.

Now, comparison of Proto-Indo-European with the other Nostratic languages, especially Proto-Kartvelian and Proto-Afrasian, allows us to refine Benveniste's theories. The most ancient patterning was probably as follows:

1. There were no initial vowels in the earliest form of Proto-Indo-European. Therefore, every root began with a consonant.
2. Originally, there were no initial consonant clusters either. Consequently, every root began with one and only one consonant.
3. Two basic syllable types existed: (A) **CV* and (B) **CVC*, where *C* = any non-syllabic and *V* = any vowel. Permissible root forms coincided exactly with these two syllable types.
4. A verbal stem could either be identical with a root or it could consist of a root plus a single derivational morpheme added as a suffix to the root: **CVC*-*VC*-. Any consonant could serve as a suffix.
5. Nominal stems, on the other hand, could be further extended by additional suffixes.

In the earliest form of Proto-Indo-European, there were three fundamental stem types: (A) verbal stems, (B) nominal and adjectival stems, and (C) pronominal and indeclinable stems.

The phonemicization of a strong stress accent in Early Proto-Indo-European disrupted the patterning outlined above. The positioning of the stress was morphologically distinctive, serving as a means to differentiate grammatical relationships. All vowels were retained when stressed but were either weakened (= "reduced-grade") or totally eliminated altogether (= "zero-grade") when unstressed:

the choice between the reduced-grade versus the zero-grade depended upon the position of the unstressed syllable relative to the stressed syllable as well as upon the laws of syllabicity in effect at that time. Finally, it was at this stage of development that the syllabic allophones of the resonants came into being.

The stress-conditioned ablaut alternations gave rise to two distinct forms of extended stems:

> Type 1: Root in full-grade and accented, suffix in zero-grade: **CV́CC*-.
> Type 2: Root in zero-grade, suffix in full-grade and accented: **CCV́C*-.

When used as a verbal stem, Type 1 could undergo no further extension. However, Type 2 could be further extended by means of a "determinative". Further addition of a determinative or suffixes pointed to a nominal stem (cf. Benveniste 1935:171; Lehmann 1952:17). According to Benveniste (1935:148), a "suffix" was characterized by two alternating forms (**-et-*/**-t-*, **-en-*/**-n-*, **-ek-*/**-k-*, etc.), while a "determinative" was characterized by a fixed consonantal form (**-t-*, **-n-*, **-k-*, etc.). Finally, Benveniste (1935:164) notes:

> … in the numerous cases where the initial [consonant group has been reconstructed in the shape] **(s)k-*, **(s)t-*, **(s)p-*, etc., with unstable sibilant, it is generally a question of prefixation, and it may be observed that the root begins with the [plain] consonant [alone excluding the sibilant].

In the earliest form of Proto-Indo-European, ablaut was merely a phonological alternation. During the course of its development, however, Proto-Indo-European gradually grammaticalized these ablaut alternations.

Proto-Indo-European had constraints on permissible root structure sequences. In traditional terms, the root structure constraints may be stated as follows (cf. Szemerényi 1996:99—100; see also Fortson 2004:54, 72, and 2010:59, 78; Meillet 1964:173—174; Lehmann 1952:17; Watkins 1998:53) (Szemerényi's notation has been retained):

Possible	Impossible
1. Voiced-voiced aspirate (**bedh*-)	I. Voiced-voiced (**bed*-)
2. Voiced-voiceless (**dek*-)	II. Voiced aspirate-voiceless (**bhet*-)
3. Voiced aspirate-voiced (**bheid*-)	III. Voiceless-voiced aspirate (**tebh*-); III is, however, possible after **s*-: **steigh*- 'to go up'
4. Voiced aspirate-voiced aspirate (**bheidh*-)	
5. Voiceless-voiced (**ped*-)	
6. Voiceless-voiceless (**pet*-)	

From a typological perspective, the first forbidden root type (**bed*-) is rather odd. Roots of this type are widespread among the world's languages, and there is

absolutely nothing to suggest that such a root type could not or should not exist in Proto-Indo-European. The only reasonable conclusion is that there is something wrong with the traditional reconstruction of the Proto-Indo-European stop system, specifically the plain voiced stops. This is, in part, what led to the suggestion that the traditional plain voiced stops may have been glottalics, since a constraint against the co-occurrence of two glottalics in a root is a recurrent feature in languages having glottalics (though not a universal). The substitution of glottalics for the traditional plain voiced stops allows for a rather straightforward reformulation of the root structure constraint rules (cf. Gamkrelidze 1976:404—405 and 1981:608—609; Hopper 1973:158—161, §3.2.6; Corbeau 2013):

1. Each root had to contain at least one non-glottalic consonant.
2. When both obstruents were non-glottalic, they had to agree in voicing.

The Proto-Indo-European root structure constraint laws thus become merely a voicing agreement rule with the corollary that two glottalics cannot cooccur in a root. Comparison with the other Nostratic languages indicates, however, that the forbidden root types must have once existed. Two rules may be formulated to account for the elimination of the forbidden types:

1. A rule of progressive voicing assimilation may be set up to account for the elimination of roots whose consonantal elements originally did not agree in voicing: **T* ~ **B* > **T* ~ **P*, **B* ~ **T* > **B* ~ **D*, etc.
2. A rule of regressive deglottalization may be set up to account for the elimination of roots containing two glottalics: **C'VC'-* > **CVC'-*. This rule finds a close parallel in Geers' Law in Akkadian (cf. Ungnad—Matouš 1969:27).

According to Gamkrelidze (1976:405 and 1981:608), Bartholomae's Law is a later manifestation of the progressive voicing assimilation rule, applied to contact sequences (for details on Bartholomae's Law, cf. Szemerényi 1996:102—103; Collinge 1985:7—11 and 263—264; Burrow 1973:90).

APPENDIX: THE PREHISTORIC DEVELOPMENT OF THE PROTO-INDO-EUROPEAN PHONOLOGICAL SYSTEM

At the end of Chapter 2 in my co-authored book *The Nostratic Macrofamily* (1994, pp. 132—140), I traced the prehistoric development of the Proto-Indo-European phonological system from Proto-Nostratic to what I call "Disintegrating Indo-European", which is the form of Proto-Indo-European that may be assumed to have existed directly prior to the emergence of the non-Anatolian Indo-European daughter languages. Basically, I recognized four stages of development:

1. Pre-Indo-European
2. Phonemic Stress Stage of Proto-Indo-European
3. Phonemic Pitch Stage of Proto-Indo-European
4. Disintegrating Indo-European

These stages are similar to what Lehmann sets up in Chapter 15, "The Development of the PIE Phonemic System", of his 1952 book *Proto-Indo-European Phonology*.

The Proto-Nostratic phonological system may be reconstructed as follows (see Chapter 12 in this book for details):

Stops and Affricates:

p^h	t^h	c^h	$č^h$	$t^{y h}$	$t\widehat{ɬ}^h$	k^h	k^{wh}	q^h	q^{wh}		
b	d	ʒ	ǯ	d^y	$d\widehat{ʒ}$ (?)	g	g^w	ɢ	$ɢ^w$		
p’	t’	c’	č’	$t’^y$	$t\widehat{ɬ}’$	k’	$k’^w$	q’	$q’^w$	ʔ	$ʔ^w$

Fricatives:

	s	š	s^y	x	x^w		h	ħ
	z	ž (?)	z^y (?)	ɣ				ʕ

Glides:

w	y

Nasals and Liquids:

m	n	n^y	ŋ
	l	l^y	
	r	r^y	

Vowels:

i (~ e)		u (~ o)
	e	o
	(ə ~) a	

Also the sequences:	iy (~ ey)	uy (~ oy)	ey	oy	(əy ~) ay
	iw (~ ew)	uw (~ ow)	ew	ow	(əw ~) aw

The correspondences between the Proto-Indo-European bilabial, dental, and velar stops as well as the glides, nasals, and liquids, on the one hand, and those of the other Nostratic languages, on the other hand, are fairly straightforward and require no further comment.

Lateralized affricates have been reconstructed for Proto-Nostratic primarily on the basis of the Afrasian evidence. Steiner (1977:40), citing a 1922 article by Trubetzkoy, mentions that the development of lateralized affricates into palatal, velar, or uvular stops (or affricates) is a common development in the Northeast Caucasian languages, thus:

t͡ɬʰ	>	k͡ɬʰ	>	k͡xʰ	>	kʰ
voiceless alveolar lateralized affricate		voiceless velar lateralized affricate		voiceless velar affricate		voiceless velar stop
t͡ɬʼ	>	k͡ɬʼ	>	k͡xʼ	>	kʼ
glottalized alveolar lateralized affricate		glottalized velar lateralized affricate		glottalized velar affricate		glottalized velar stop

A shift of lateralized affricates into velar stops, similar to that shown above, may be posited for Pre-Proto-Indo-European.

The palatalized alveolar stops, palato-alveolar affricates, and dental affricates posited for Proto-Nostratic correspond to dental stops in Proto-Indo-European. Two explanations are possible to account for this correspondence: (A) Proto-Indo-European retained the original value, and the palatalized alveolar stops, palato-alveolar affricates, and dental affricates were secondarily derived from earlier dental stops in the other languages, or (B) the other languages reflect the original patterning, and the Indo-European developments are secondary. The data from the other Nostratic languages unequivocally favors the second alternative. Typological considerations also point in this direction. In general, a contrast between velars and labiovelars, such as that posited for Proto-Indo-European, implies a frontal contrast of some kind.

It may thus be assumed that the palatalized alveolar stops, palato-alveolar affricates, and dental affricates were inherited by Pre-Proto-Indo-European from Proto-Nostratic. However, since these sounds are not found in any of the daughter languages, they must have been eliminated at some point within Proto-Indo-European proper.

The first change that may be assumed to have taken place was the merger of the inherited dental affricates with the inherited palato-alveolar affricates: *c^h, *ʒ, *c' > *$č^h$, *ǯ, *$č'$. This change actually occurred in Proto-Eurasiatic (see the Appendix to Chapter 12).

Next, the palatalized sounds were depalatalized and merged with their non-palatalized counterparts in all positions (as has happened, for example, in the case of Aramaic, where Proto-Semitic *d^y, *t'^y, *t^y have become Aramaic *d*, *ṭ*, *t*, respectively [cf. Moscati 1964:29—39, §9.18 — Moscati posits interdental fricatives for Proto-Semitic, but see Ehret 1995:251—254 on the possibility that this series may have been palatalized alveolars instead — note expecially the table of correspondences on p. 253], and in Ancient Egyptian, where *t̲* [𓏏] and *d̲* [𓂝] were sometimes depalatalized to *t* [𓐍] and *d* [𓂧], respectively, under unknown conditions [cf. J. P. Allen 2013:49]). Within Indo-European, the same phenomenon may be observed in modern Polabian, Czech, Slovak, Bulgarian, and Ukrainian, where the inherited palatalized consonants were depalatalized before front vowels, "where palatalization was automatic or nearly so…, i.e. devoid of phonemic function" (cf. Shevelov 1964:494). Thus, the developments were as follows:

Pre-Proto-Indo-European		Early Proto-Indo-European
d^y	>	d
t^{yh}	>	t^h
t'^y	>	t'
n^y	>	n
l^y	>	l
r^y	>	r

Pre-Proto-Indo-European was followed by the Phonemic Stress Stage of Proto-Indo-European, which is the earliest stage of Proto-Indo-European proper that can be recovered. This stage was characterized by the phonemicization of a strong stress accent that caused the reduction and elimination of the vowels of unaccented syllables — that is to say that the phonemicization of a strong stress accent was responsible for the development of quantitative vowel gradation. This change was the first in a long series of changes that brought about the grammaticalization of what began as a purely phonological alternation (cf. Fortson 2004:74 and 2010:81), and which resulted in a major restructuring of the earlier, Pre-Proto-Indo-European vocalic patterning. This restructuring of the vowel system was a continuous process, which maintained vitality throughout the long, slowly-evolving prehistory of the Indo-European parent language itself and even into the early stages of some of the daughter languages. On grammaticalization in general, cf. C. Lehmann 2015.

It was during the Phonemic Stress Stage of Proto-Indo-European that the syllabic resonants came into being. Lengthened-grade vowels may also have first appeared during this stage of development.

The phonological system of the Phonemic Stress Stage of Proto-Indo-European may be reconstructed as follows:

Obstruents:	p^h	t^h	$č^h$	k^h	k^{wh}	(q^h)			
	b	d	ǰ	g	g^w	(ɢ)			
	p’	t’	č’	k’	$k’^w$	(q’)	$(q’^w)$	ʔ	
		s		x	x^w			h	ħ
				γ					ʕ
Glides:	w(/u)		y(/i)						
Nasals and Liquids:		m/m̥	n/n̥	l/l̥	r/r̥				
Vowels:		i				u			
			e		o				
				ə					
				e ~ a					
		ī				ū			
			ē		ō				
				ē ~ ā					
Also the sequences:		iy ~ ey		uy ~ oy		ey ~ ay		əy	
		iw ~ ew		uw ~ ow		ew ~ aw		əw	
		īy ~ ēy		ūy ~ ōy		ēy ~ āy			
		īw ~ ēw		ūw ~ ōw		ēw ~ āw			

Note: **ə* > **e* under stress.

Phonemic analysis:

A. Obstruents: always non-syllabic.
B. Resonants (glides, nasals, and liquids): syllabicity determined by surroundings: the resonants were syllabic when between two non-syllabics and non-syllabic when either preceded or followed by a vowel.
C. Vowels: always syllabic.

Suprasegmentals:

A. Stress: applied only to vowels; its postion in a word was used as a means to indicate grammatical relationships.
B. Pitch: non-distinctive.

In the latest period of development (what I call “Disintegrating Indo-European”), quantitative ablaut was no longer a productive process. Had there been a strong stress accent at this time, each Proto-Indo-European word could have had only one syllable with full-grade vowel, the vowels of unstressed syllables being either

weakened (= "reduced-grade") or lost altogether (= "zero-grade"). However, since the majority of reconstructed Proto-Indo-European words have more than one full-grade vowel, the stress accent must have become non-distinctive at some point prior to the latest stage of development.

In the Phonemic Pitch Stage of Proto-Indo-European, pitch accent replaced stress accent, and the accent lost its ability to weaken or eliminate the vowels of unaccented syllables, that is to say, Proto-Indo-European changed from a "stress-accent" language to a "pitch-accent" language. Here, the basic rule was that morphologically significant syllables were marked by high pitch, while morphologically nonsignificant syllables were marked by low pitch.

During the Phonemic Pitch Stage of Proto-Indo-European, the palato-alveolar affricates underwent deaffricatization and merged with the dental stops (**č^{h}*, **ǯ*, **č'* > **t^{h}*, **d*, **t'*) (a similar development has taken place, for instance, in Finnic (in part), where **č* > *t* or *h* [cf. Collinder 1960:88], and Samoyed within Uralic, where **č* > **t* [cf. Janhunen 1998a:462], and in Toda within Dravidian, where initial **c-* [t͡š] > *t-* [cf. Krishnamurti 2003:124—125]); also worth noting is the development of the Proto-Semitic glottalized dental affricate **c'* [traditional *ṣ*] in Amharic, Gurage, Harari, Gafat, and Argobba, where **c'* > *t̪* [cf. Leslau 1987:xxv—xxvi]).

The final changes that must be assigned to the Phonetic Pitch Stage of Proto-Indo-European were: (A) the merger of the earlier postvelars with the plain velars, (B) the merger of the earlier velar fricatives with the pharyngeal fricatives, and (C) the development of the pharyngeal fricatives into the corresponding multiply-articulated pharyngeal/laryngeal fricatives: **ħ* > **ʜ͡ħ* and **ʕ* > **ʢ͡ɦ*.

The phonological system of the Phonemic Pitch Stage of Proto-Indo-European may be reconstructed as follows:

Obstruents:	p^{h}	t^{h}	k^{h}	k^{wh}		
	b	d	g	g^{w}		
	(p')	t'	k'	k'^{w}		
		s				
Laryngeals:	ʔ	h	ʜ͡h	ʜ͡h^{w}		
			ʢ͡ɦ			
Nasals and Liquids:	m/m̥	n/n̥	l/l̥	r/r̥		
Glides:	w(/u)	y(/i)				
Vowels:	e	o	a	i	u	ə
	ē	ō	ā	ī	ū	

Notes:

1. High vowels had non-phonemic low variants when contiguous with so-called "*a*-coloring" laryngeals (**h*, **ʜ͡ħ* and **ʢ͡ɦ*), while the vowel **e* was lowered and colored to **a* in the same environment.

2. Apophonic **o* had not yet developed. It arose later in Disintegrating Indo-European from apophonic **a*. However, already during this stage, and even earlier, in the Phonemic Stress Stage of Proto-Indo-European and in Pre-Proto-Indo-European, there was a non-apophonic **o* that had been inherited from Proto-Nostratic.
3. The velar stops developed non-phonemic palatalized allophones when contiguous with front vowels and **y*.
4. There were no voiced aspirates at this time. They developed later in Disintegrating Indo-European from earlier plain voiced stops.
5. It was probably at the end of the Phonemic Pitch Stage that the Anatolian languages became separated from the main speech community.
6. Some palato-alveolar affricates may have been preserved initially in Hittite in a small number of relic forms (see Part Two, Comparative Vocabulary, nos. 300 and 304, for possible examples).

Phonemic analysis: unchanged.

Suprasegmentals:

A. Stress: non-distinctive.
B. Pitch: distribution morphologically conditioned: high pitch was applied to morphologically-distinctive vowels, while low pitch was applied to morphologically-non-distinctive vowels.

During the Phonemic Pitch Stage of development, the system of vowel gradation assumed the following form:

	Lengthened-Grade	Normal-Grade	Reduced-Grade	Zero-Grade
A.	ē ~ ā	e ~ a	ə	Ø
B.	ēy ~ āy	ey ~ ay	i, əyV	y
	ēw ~ āw	ew ~ aw	u, əwV	w
	ēm ~ ām	em ~ am	m̥, əmV	m
	ēn ~ ān	en ~ an	n̥, ənV	n
	ēl ~ āl	el ~ al	l̥, əlV	l
	ēr ~ ār	er ~ ar	r̥, ərV	r
C.		Ae [Aa] ~ Aa	Aə	A
D.		Aey [Aay]	Ai, AəyV	Ay
		Aew [Aaw]	Au, AəwV	Aw

Notes:
1. Long vowel gradation did not exist during this period of development. It arose later, in Disintegrating Indo-European, when the loss of preconsonantal laryngeals caused the compensatory lengthening of preceding short vowels.

2. The symbol **ə* is used here to indicate the reduced-grade vowel corresponding to normal-grade **e* and **a*. This is the so-called "schwa secundum" of traditional Indo-European grammar. It is usually written **ь*.

The Phonemic Pitch Stage of Proto-Indo-European was followed by Disintegrating Indo-European, which may be defined as the stage of development existing between the separation of the Anatolian languages from the main speech community and the emergence of the non-Anatolian daughter languages.

In Disintegrating Indo-European, the voiced stops became voiced aspirates (at least in some dialects), and the laryngeals were mostly lost. First, the laryngeals **ʔ* and **h* were lost initially before vowels. In all other environments, **ʔ* and **h* merged into **h*. Then, the laryngeals **ħ͡ħ* and **ʕ͡ʕ* became **h*. Later, the single remaining laryngeal **h* was lost initially before vowels (except in Pre-Proto-Armenian) and medially between an immediately preceding vowel and a following non-syllabic. This latter change caused compensatory lengthening of preceding short vowels (**eHC*, **oHC*, **aHC*, **iHC*, **uHC* > **ēC*, **ōC*, **āC*, **īC*, **ūC*). Note: **h* may have been simply lost without a trace in certain contexts (cf. Byrd 2010).

The palatovelars became phonemic in the Disintegrating Indo-European antecedent of the satəm languages but remained subphonemic in the Disintegrating Indo-European antecedent of centum languages. Pulju (1995:43) summarizes the developments of the gutturals in the Indo-European daughter languages as follows:

> A three-way distinction between palatovelars, plain velars, and labiovelars is unavoidable for PIE, though it grew out of a Pre-PIE two-way distinction between plain velars and labiovelars. Moreover, the distinction between the rare plain velars and the other series in PIE carried a low functional load. Hence, the PIE system was usually reduced to post-PIE systems with only a two-way distinction, always preserving the functionally most important palatovelar vs. labiovelar difference. Plain velars merged structurally with either palatovelars or labiovelars in all languages but Albanian; there is no solid basis for making these two types of merger diagnostic of a split of PIE into so-called centum and satem dialects.

For late Disintegrating Indo-European, the Proto-Indo-European phonological system may be reconstructed as follows (the phonemes in the first column are voiceless aspirated, the second are glottalized, and the third are voiced aspirated):

Obstruents:	p^h	p’	b^h	(bilabial)
	t^h	t’	d^h	(dental)
	k^{yh}	$k’^y$	g^{yh}	(palatovelar)
	k^h	k’	g^h	(velar)
	k^{wh}	$k’^w$	g^{wh}	(labiovelar)
		s		
Laryngeals:		h/ḫ		

Resonants:	m/m̥	n/n̥	l/l̥	r/r̥	w/u	y/i
Vowels:	e	o	a	(i)	(u)	ə
	ē	ō	ā	ī	ū	

Notes:
1. The palatovelars (*k^{yh}, *g^{yh}, *k'^{y}) are traditionally written *$\hat{k}$, *$\acute{g}h$, *$\hat{g}$ or *$\hat{k}$, *$\hat{g}h$, *$\hat{g}$, occasionally even *$\acute{k}$, *$\acute{g}h$, *$\acute{g}$, respectively.
2. The above reconstruction is a composite — details about developments in the individual daughter languages are given in Chapter 5.

During the Disintegrating Indo-European period of development, the system of vowel gradation appeared as follows:

I. Short Vowel Gradation:

	Lengthened-Grade	Normal-Grade	Reduced-Grade	Zero-Grade
A.	ē ~ ō	e ~ o	ə	Ø
B.	ēy ~ ōy	ey ~ oy	i, əyV (> iyV)	y
	ēw ~ ōw	ew ~ ow	u, əwV (> uwV)	w
	ēm ~ ōm	em ~ om	m̥, əmV (m̥mV)	m
	ēn ~ ōn	en ~ on	n̥, ənV (n̥nV)	n
	ēl ~ ōl	el ~ ol	l̥, əlV (l̥lV)	l
	ēr ~ ōr	er ~ or	r̥, ərV (r̥rV)	r
C.		a ~ o	ə	Ø
D.		ay	i, əyV (> iyV)	y
		aw	u, əwV (> uwV)	w

II. Long Vowel Gradation:

E.	ē ~ ō	h̥
F.	ō	h̥
G.	ā ~ ō	h̥

Note: The symbol *$h̥$ is used here to indicate the syllabic form of the one remaining laryngeal, **h*. This is the so-called "schwa primum" of traditional Indo-European grammar. It is usually written **ə*.

CHAPTER FIVE

AN OUTLINE OF THE DEVELOPMENT OF THE PROTO-INDO-EUROPEAN PHONOLOGICAL SYSTEM IN THE INDO-EUROPEAN DAUGHTER LANGUAGES

5.1. ANATOLIAN

In Pre-Proto-Anatolian, the glottalics were deglottalized, resulting in the following system, with the three-way contrast (1) voiceless aspirated ~ (2) plain (unaspirated) voiceless ~ (3) plain voiced:

	1	2	3
Bilabial:	p^h	p	b
Dental:	t^h	t	d
Velar:	k^h	k	g
Labiovelar:	k^{wh}	k^w	g^w

References: Bomhard 1986a and 1992c; Gamkrelidze 1982; Gamkrelidze—Ivanov 1995.I:40—43; Kronasser 1956:35—96; Melchert 1984, 1992c, 1994a (Melchert tentatively assumes that column 2 was voiced), 1997, and 2017:176—177; Kimball 1999 and 2017; Hoffner—Melchert 2008:24—50; Sturtevant 1951:29—66; Held—Schmalstieg 1969; Kloekhorst 2008b:15—101 and 2016; J. Friedrich 1960:25—37; Patri 2009 and 2019.

5.1.1. DOUBLE WRITING OF MEDIAL STOPS IN HITTITE

"Sturtevant's Law" is the name given to the Hittite scribal convention according to which double writing of medial stops (though only when the cuneiform syllabary makes this possible, and even then not consistently [cf. Melchert 1994a:14]) in certain words contrasts with single writing of medial stops in certain other words. This writing convention is interpreted under Sturtevant's Law to be the method by which the Hittite scribes indicated some sort of phonemic contrast, usually taken to be a contrast between medial voiceless stops on the one hand and medial voiced stops on the other (cf. Sturtevant 1951:26—28, §53). This interpretation is based upon the observation that words exhibiting medial double writing of stops generally correspond etymologically to words in other Indo-European languages with medial voiceless stops (or their equivalents), while words exhibiting medial single writing of stops generally correspond etymologically to words in other Indo-European languages with medial voiced stops (or their equivalents), the latter being derived from what has traditionally been reconstructed as either plain voiced stops or as

voiced aspirated stops at the Proto-Indo-European level. The following examples illustrate the general patterning (the Proto-Indo-European reconstructions represent the Phonemic Pitch Stage of Proto-Indo-European ["Pre-Anatolian Proto-Indo-European"], which was the stage of development just before the separation of the Anatolian daughter languages from the main speech community):

Medial Double Writing:

A. Hittite (3 pl. pres.) *li-ip-pa-an-zi* 'they smear' (also written *li-pa-a-an-zi*) ~ Sanskrit *liptá-ḥ* 'smeared, anointed'; Greek λιπαρός 'oily, greasy', λίπος 'fat, oil' < Proto-Indo-European **lip^{h}-*.
B. Hittite *a-ap-pa* 'afterwards, back, again' ~ Sanskrit *ápa* 'away, from, off'; Greek ἄπο, ἀπό 'from, away from, far from, apart from, away, off, back again' < Proto-Indo-European **hep^{h}a-* [*hap^{h}a-] (later **hep^{h}o-* [*hap^{h}o-]).
C. Hittite (3 sg. mid.) *ki-it-ta(-ri)* 'lies' ~ Sanskrit (3 sg. mid. impf.) *á-śeta* 'lay', (3 sg. mid. pres.) *śéte* 'lies'; Avestan *saēte* 'lies'; Greek (3 sg. impf.) ἔ-κειτο 'lay', (3 sg. pres.) κεῖται 'lies' < Proto-Indo-European 3 sg. mid. ending **-t^{h}a-* (later **-t^{h}o-*).
D. Hittite (acc. sg.) *ú-it-ta-an* 'year' ~ Greek ἔτος 'year'; Latin *vetus* 'old' < Proto-Indo-European **wet^{h}-*.
E. Hittite (3 sg. pres.) *lu-uk-ki-iz-zi* 'kindles, grows light' (also written *lu-uk-zi*) ~ Greek λευκός 'light, bright, brilliant, white'; Latin *lūceō* 'to shine' < Proto-Indo-European **luk^{h}-*, **lewk^{h}-*.

Medial Single Writing:

A. Hittite (nom.-acc. sg.) *ne-pí-iš* 'heaven, sky' ~ Sanskrit *nábhas-* 'sky, cloud, mist'; Greek νέφος 'cloud'; Old Church Slavic *nebo* 'sky' < Proto-Indo-European **nebas-* (later **neb^{h}os-*).
B. Hittite (nom.-acc. sg.) *pí-e-da-an* 'place' ~ Sanskrit *padám* 'step, footstep, position, site'; Greek πέδον 'the ground, earth' < Proto-Indo-European **p^{h}et'am* (later **p^{h}et'om*).
C. Hittite (nom.-acc. sg.) *wa-a-tar* 'water' ~ Sanskrit *udán-* 'water'; Greek ὕδωρ 'water'; Gothic *watō* 'water'; Old Church Slavic *voda* 'water' < Proto-Indo-European **wet'-*/**wat'-*/**ut'-* (later **wet'-*/**wot'-*/**ut'-*).
D. Hittite (1 sg. pres.) *e-it-mi* 'I eat' ~ Sanskrit *ádmi* 'I eat'; Greek ἔδομαι 'I eat'; Latin *edō* 'I eat' < Proto-Indo-European **ʔet'-*.
E. Hittite (nom.-acc. sg.) *i-ú-kán*, *i-ú-ga-an* 'yoke' ~ Sanskrit *yugám* 'yoke'; Greek ζυγόν 'yoke'; Latin *iugum* 'yoke'; Gothic *juk* 'yoke'; Old Church Slavic *igo* (< **jъgo*) 'yoke' < Proto-Indo-European **yuk'am* (later **yuk'om*).
F. Hittite (nom. sg.) *ḫar-ki-iš* 'white' ~ Sanskrit *árjuna-ḥ* 'white, bright'; Greek ἀργός 'shining, bright, glistening'; Latin *argentum* 'silver' < Proto-Indo-European **ḫ͡herk'-* [*ḫ͡hark'-].
G. Hittite (nom. sg.) *pár-ku-uš* 'high' ~ Armenian *barjr* 'high'; Sanskrit *bṛhánt-* 'high' < Proto-Indo-European **bṛg-* (later **b^{h}ṛg^{h}-*).

H. Hittite (nom.-acc. sg.) *ḫé-kur*, *ḫé-gur* ‘summit, peak’ ~ Sanskrit *ágram* ‘point, tip, summit’ < Proto-Indo-European **Hek’^{w}r-*.

There also exist several well-known exceptions to Sturtevant’s Law, in which words exhibiting medial double writing of stops in Hittite correspond etymologically to words in other Indo-European daughter languages with medial voiced stops. Examples include (cf. Kronasser 1966:14; Bomhard 1984b:116):

A. Hittite *ú-uk-ga* ‘I’ (also written *ú-uk*, *ú-ga*; Melchert [1994a:7] considers the *u* to be analogical after the 2 sg. personal pronoun *tu-uk*, *tu-ga* ‘you’, while Kloekhorst [2008b:112—114] considers it to be from the Proto-Anatolian oblique form **ʔMúg*) ~ Latin *egō*, *egŏ* ‘I’; Greek ἐγώ(ν) ‘I’ < Proto-Indo-European **ʔek’-aH* (later **ʔek’-oH*).
B. Hittite 2 pl. mediopassive primary ending *-dduma* in, for example, *i-ya-at-du-ma* ‘you go’ ~ Sanskrit 2 pl. mid. secondary ending *-dhvam*; Avestan 2 pl. mid. secondary ending *-δwəm*; Greek 2 dual mid. primary and secondary ending -σθον (< **-zd^{h}wom*), 2 pl. mid. ending -σθε < Proto-Indo-European **-dwem*/**-dwam*/**-dum* (later **-d^{h}wem*/**-d^{h}wom*/**-d^{h}um*).
C. Hittite (3 sg. pres.) *píd-da-i*, *pád-da-i* ‘to dig’ ~ Latin *fodiō* ‘to dig’; Lithuanian *bedù*, *bèsti* ‘to dig, to bury’; Gaulish *bedo-* ‘canal, ditch’; Old Church Slavic *bodǫ*, *bosti* ‘to stick, to prick’ < Proto-Indo-European **bed-*/**bad-* (later **b^{h}ed^{h}-*/**b^{h}od^{h}-*).
D. Hittite (acc.-dat. sg.) *am-mu-uk-ga* ‘to me’ (also written *am-mu-uk*, *am-mu-ug-ga*, *am-mu-uq-qa*, *am-mu-uk-qa*) ~ Greek (acc. sg.) ἔμε-γε ‘me’ < Proto-Indo-European **-k’e*.
E. Hittite (nom. sg.) *me-ik-ki-iš* ‘large’ ~ Greek μέγας ‘great’ < Proto-Indo-European **mek’-*.

It is these exceptions that previously led me to question the validity of Sturtevant’s Law (cf. Bomhard 1984b:116—119).

5.1.2. THE RECONSTRUCTION OF THE PROTO-INDO-EUROPEAN STOP SYSTEM

At the beginning of the twentieth century, the Neogrammarian reconstruction of the Proto-Indo-European phonological system, which was based upon the principle that sound laws admit no exceptions, was widely accepted as being a fairly accurate representation of what had existed in the Indo-European parent language. To this day, the Neogrammarian reconstruction (or variations of that reconstruction) enjoys widespread support among Indo-Europeanists. The Neogrammarian reconstruction of the Proto-Indo-European stop system, which was modeled after the phonological system found in Old Indo-Aryan (represented by Vedic and Classical Sanskrit) consisted of a four-way contrast of (1) plain voiceless stops, (2) voiceless aspirated stops, (3) plain voiced stops, and (4) voiced aspirated stops, thus (cf. Brugmann 1904:52; see also Szemerényi 1996:54—69; Burrow 1973:67):

1	2	3	4	
p	ph	b	bh	(bilabial)
t	th	d	dh	(dental)
k̂	k̂h	ĝ	ĝh	(palatal)
q	qh	g	gh	(pure velar)
q^{u}	q^{u}h	g^{u}	g^{u}h	(labiovelar)

During the last century, it became widely accepted that the traditional voiceless aspirates (column 2) should be removed from the Proto-Indo-European phonological inventory (cf. Bomhard 1986a:69—71 for details). The problem with removing the voiceless aspirates, however, is that the resulting system has no typological parallels among the known languages of the world (cf. Jakobson 1971[1957]:528; Martinet 1970:115). And yet, on structural grounds, positing a three-way contrast (without the voiceless aspirates) for Proto-Indo-European instead of the four-way contrast (with the voiceless aspirates) posited by the Neogrammarians seems fully justified.

There are also problems involving the traditional plain voiced stops (column 3). One such problem, which is usually mentioned in the standard handbooks, is the unexpected statistically low frequency of occurrence of the traditional plain voiced bilabial stop **b*. Such a frequency distribution is not at all characteristic of /b/ in natural languages having a voicing contrast in stops (for details, cf. Gamkrelidze 1978:9—46). Rather, the frequency distribution points to the original *non-voiced* character of this sound in Proto-Indo-European. Indeed, the frequency distribution of all of the traditional plain voiced stops (**b*, **d*, **ĝ*, **g*, **g^{u}*) points to the non-voiced character of the entire series when viewed from a typological perspective. Moreover, the traditional plain voiced stops are rarely found in pronouns and in inflectional affixes. Finally, there is the problem of the root structure constraint that prohibits the co-occurrence of two plain voiced stops in a given root.

It was in trying to find solutions to these problems in particular that the Georgian scholar Thomas V. Gamkrelidze and the Russian scholar Vjačeslav V. Ivanov, on the one hand, and the British-born American scholar Paul J. Hopper, on the other, working independently, were led to propose, in the early 1970's, a radical revision of the Proto-Indo-European stop system. Observing that the traditional plain voiced stops seemed to exhibit many of the typological characteristics of glottalized stops (ejectives), they proposed reinterpreting this series as ejectives. In their version of what has now come to be known as the "Glottalic Theory", Gamkrelidze and Ivanov made no changes to the traditional voiced aspirates, but they reinterpreted the traditional plain voiceless stops as voiceless aspirates. In this revised interpretation, aspiration is viewed as a redundant feature, and the phonemes in question could be realized as allophonic variants with or without aspiration depending upon the paradigmatic alternation of root phonemes. The system of Gamkrelidze and Ivanov may be represented as follows (cf. Gamkrelidze 1976:403 and 2001a:84):

1	2	3	4	
ph/p	-	(p’)	bh/b	(bilabial)
th/t	-	t’	dh/d	(dental)
k̂h/k̂	-	k̂’	ĝh/ĝ	(palatal)
kh/k	-	k’	gh/g	(pure velar)
kʷh/kʷ	-	k’ʷ	gʷh/gʷ	(labiovelar)

The revisions proposed by Gamkrelidze, Hopper, and Ivanov provide typologically natural explanations for the problems mentioned above, specifically:

A. By reinterpreting the traditional plain voiceless stops (column 1) as voiceless aspirates, there is no longer a problem, from a typological point of view, with positing a series of voiced aspirates (column 4) for Proto-Indo-European, since the imbalance caused by the removal of the traditional voiceless aspirates (column 2) is eliminated.
B. Reinterpretation of the traditional plain voiced stops (column 3) as glottalics makes it easy to account for the statistically low frequency of occurrence of the traditional plain voiced bilabial stop **b* (which becomes a bilabial ejective **p’* in the revised system), since the glottalic member is always characterized by a low frequency of occurrence (there often being a total absence at this point of articulation) in the bilabial series in attested languages having ejectives.
C. In languages having ejectives, it is common for ejectives to be either excluded from or underrepresented in inflectional affixes and pronouns.
D. Several languages with ejectives have a constraint against the co-occurrence of two ejectives in a root. Thus, reinterpretation of the traditional plain voiced stops as glottalics provides a typologically natural explanation for the root structure constraint prohibiting the co-occurrence of two (traditional) plain voiced stops in a given root.

Moreover, the revisions proposed by Gamkrelidze, Hopper, and Ivanov provide new insights into the underlying principles governing Grassmann’s Law and Barthomomae’s Law. Finally, it may be noted that strong support for the changes proposed by Gamkrelidze, Hopper, and Ivanov is to be found in Germanic, Armenian, and (the poorly-attested) Phrygian (cf. Diakonoff—Neroznak 1985:5). According to the traditional interpretation, Germanic, Armenian, and Phrygian had been thought to have undergone “sound shifts” (in German, *Lautverschiebungen*). Under the revised interpretation, however, they are rightly seen as relic areas.

The Proto-Indo-European stop system reconstructed above may be viewed as reflecting a late stage of development. For Pre-Anatolian Proto-Indo-European, I have argued elsewhere that the traditional voiced aspirates are to be reconstructed as plain voiced stops and that the development of this series into voiced aspirates is a later development (cf. Bomhard 1984b:31—34; 1996a:50 and 54). That this series was not aspirated in Pre-Anatolian Proto-Indo-European will be demonstrated below.

5.1.3. FROM PROTO-INDO-EUROPEAN TO PROTO-ANATOLIAN

The three series reconstructed for Proto-Indo-European in the preceding section were preserved as separate series in Proto-Anatolian. This is clear, for instance, from the different treatment of the voiced and voiceless velar stops before high front vowels in the Luwian branch of Anatolian (Hieroglyphic and Cuneiform Luwian along with the later Lycian). Here, the voiceless members are preserved, while the voiced member is lost; for example:

A. Cuneiform Luwian *kiša-* 'to comb, to card' ~ Hittite *kišai-* 'to comb' < Proto-Anatolian **k^{h}es-* 'to comb, to card' < Pre-Anatolian Proto-Indo-European **k^{h}es-*. Probable non-Anatolian cognates include Greek κέσκεον (< **k^{h}es-k^{h}es-* [reduplicated]) 'tow, oakum'; Old Church Slavic *češǫ*, *česati* 'to comb, to pull off'; Russian *česát'* [чесать] 'to comb, to card'; Lithuanian *kasù*, *kàsti* 'to dig, to rake'.
B. Cuneiform Luwian (nom. sg.) *(i-)iš-ša-ri-iš* 'hand'; Hieroglyphic Luwian (dat. sg.) *istri* 'hand'; Lycian *izri-* 'hand' (all with loss of an earlier initial voiced velar before high front vowel) ~ Hittite (nom.-acc. sg.) *ki-eš-šar* 'hand' < Proto-Anatolian **gēsar* 'hand' < Pre-Anatolian Proto-Indo-European **gēsr̥*. Non-Anatolian cognates include Sanskrit *hásta-ḥ* 'hand'; Old Persian *dasta-* 'hand'; Avestan *zasta-* 'hand'; Latin *praestō* (< **prae-hestōd*) 'at hand, ready'. Note: The Hieroglyphic Luwian form contains an epenthetic *t*.

More evidence is possibly to be found in the treatment of dentals initially before high front vowels and **y* in Hittite. In this case, the voiceless aspirated and plain voiced members are preserved (though **t^h-* later becomes *z-* (= /t͡s/) in this environment in Hittite, but not in the other older Anatolian languages), while the plain voiceless (from earlier glottalized) member becomes *š*, as shown in the following examples (cf. Melchert 1994a:118):

A. Hittite (dat.-loc. sg.) *šiwatti* 'day' ~ Palaic (nom. sg.) *Ti-ya-az(-)* name of the sun-god; Luwian (nom. sg.) *Ti-wa-az* name of the sun-god; Hieroglyphic Luwian *Tiwat-* name of the sun-god, (adj.) *tiwatami-* 'bright, sunny' < Proto-Anatolian **tyēwat-* < Pre-Anatolian Proto-Indo-European **t'yēw-*. Non-Anatolian cognates include: Sanskrit *dyáu-ḥ* 'heaven, sky, day'; Armenian *tiv* 'day'; Latin *diēs* 'day'; Old Irish *dïe*, *dïa* 'day'.
B. Hittite (gen. sg.) *ši-(i-)ú-na-aš* 'god' < Proto-Anatolian **tyū́-* < Pre-Anatolian Proto-Indo-European **t'yḗw-* (cf. Melchert 1994a:150). Non-Anatolian cognates include Greek Ζεύς 'Zeus', δῖος 'god-like, divine'; Sanskrit *devá-ḥ* 'god'; Latin *deus* 'god'.

There may be additional evidence from the later Lycian and Lydian, as Shevoroshkin (1988) has tried to show. Shevoroshkin claims, for instance, that the (traditional) Proto-Indo-European stop system developed as follows in Lycian:

Proto-Indo-European	Milyan Initially	Milyan Medially	Lycian Initially	Lycian Medially
t	t-	-t-	t-	-t-
d	d-	-d-	dd-	-d-
dh	t-	-d-	t-	-d-

Some of the evidence that Shevoroshkin adduces to support his views, however, is questionable and is to be treated with the utmost caution. Moreover, there is other Lycian evidence, not cited by Shevoroshkin, that points to alternative interpretations (note especially Melchert's [1994a:53—54] critical assessment of Shevoroshkin's views).

There are enough clues within the Anatolian daughter languages to support the contention that the three series of stops reconstructed for the phonological system of the Indo-European parent language maintained their separate identity in Proto-Anatolian. It is not possible to tell, however, whether or not series 3 was glottalized at the Proto-Anatolian level, though there is nothing to indicate that it was. I assume that series 3 was not glottalized in Proto-Anatolian. The most important point to bear in mind is that it is series 3 and 4 that are represented by medial single writing in Hittite and that it is series 1 that is represented by medial double writing. Thus, the Proto-Anatolian stop system is probably to be reconstructed as follows:

1	2	3	4
p^h	-	p	b
t^h	-	t	d
k^h	-	k	g
k^{wh}	-	k^w	g^w

Note: Melchert (1994a:53) assumes that series 3 and 4 merged in Proto-Anatolian. He further assumes (1994a:21) that the earlier voicing contrast was replaced by a fortis ~ lenis opposition in the older Anatolian daughter languages.

5.1.4. HITTITE

Hittite was written in a cuneiform syllabary derived from a form of Old Akkadian cuneiform in use in Northern Syria in the beginning of the second millennium BCE (cf. Gamkrelidze 1968:91—92). Now, the older cuneiform writing system, which was developed by the Sumerians, was not suited to rendering Akkadian, much less Hittite. In Old Akkadian, voiceless, voiced, and emphatic consonants were not differentiated in the writing system, though methods were gradually developed to represent most of the Akkadian phonological distinctions. This is important, for no attempt was ever made, even after Akkadian had introduced separate syllabograms to differentiate voiceless, voiced, and emphatic consonants, to modify the Hittite writing practices to make use of the same methods to note a voicing contrast in

stops. We must conclude, therefore, that the Hittite scribes did not feel that it was worthy of noting such a contrast, regardless of what the underlying phonetics may have been.

What then, if anything, does medial double writing of stops indicate if not a voicing contrast? The answer to this question can be ascertained by looking closely at the Proto-Anatolian stop system reconstructed above. Series 1 is differentiated from series 3 by the presence of aspiration and from series 4 by the absence of voicing, while series 3 and 4 are differentiated from each other by a contrast in voicing. Since it is only series 1 that is represented by medial double writing, it must have been the feature of aspiration that was considered significant by the Hittite scribes. This means that series 4 cannot have been aspirated since it, too, would have been represented by medial double writing. It also means that the opposition of medial double writing and medial single writing cannot have indicated a voicing contrast, since, if that had been the case, then series 3 would also have been represented by medial double writing, which is clearly not the case, both series 3 and 4 being represented by medial single writing. It should be noted here that Gamkrelidze (1968:94) was the first to suggest that medial double writing of stops in Hittite was used as a means to indicate the presence of aspiration (Patri 2009 reaches the same conclusion):

> The aspirated stops were rendered in Hittite cuneiform by double writing of consonants, whereas single writing was used to represent plain stops.

Gamkrelidze devotes two later articles (1982 and 2008) to a detailed analysis of Hittite consonantism, noting specifically in the first article (1982:78—79):

> In light of these facts, Sturtevant's rule acquires a completely different significance: The graphic reduplication of plosives is used to denote not the simple voiceless plosives but the corresponding aspirated phonemes, while their single writing was used for non-aspirated consonants.
>
> Thus we can reach the conclusion that the Hittite phonological system was characterized by two series of plosives: aspirated ones denoted by the graphic reduplication of the relevant consonant on the one hand, and non-aspirated ones on the other, denoted by single writing of the corresponding consonant.
>
> Three series of Proto-Indo-European plosives: 1) glottalized, 2) voiced (aspirated), and 3) voiceless (aspirated) were reduced in the Hittite phonological system into two series opposed to each other by virtue of aspiration. The differentiating feature for the phonological opposition of plosives is only the factor of aspiration (tenseness), regardless of the original voiced/unvoiced opposition of the plosives, which had phonemic significance in the Proto-Indo-European system. The correlation of Proto-Indo-European plosives depending upon whether they were voiced, voiceless or glottalized was replaced in the Hittite phonological system by the correlation on the basis of "aspiration" (tenseness).
>
> The feature of aspiration, which had been phonologically irrelevant with the phonemes of series 2) and 3) in Proto-Indo-European, became a phonologically significant feature in the Hittite system of plosives. In the process, the Proto-Indo-European series 1) and 2) merged into a general series

of non-aspirated plosives as opposed to the series of aspirated ones, which derives from the Proto-Indo-European series 3) of voiceless (aspirated) plosives.

With the adoption of the Akkadian cuneiform writing, the two series of Hittite plosives — the simple and the aspirated — were written not by the signs for voiced and voiceless plosives, as these were not differentiated in the early Akkadian writing system, but with the single and double writing of the respective consonants. Accordingly, the *single* writing of a consonant was used to express *simple* plosives, while for the Hittite *aspirated* (tense) plosives a new means of denotation was found, that is the *reduplication* of the consonant in question, by which was solved the problem of how to differentiate graphically between simple plosive and the corresponding aspirated consonant.

This does not explain the whole picture, however, for we must still account for the exceptions to Sturtevant's Law. Since the exceptions exhibit medial double writing of stops in Hittite words which correspond etymologically to words in other Indo-European languages with medial voiced stops (or their equivalents, these being derived from either earlier glottalized stops or earlier voiced aspirates at the Proto-Indo-European level), the distinguishing characteristic cannot have been aspiration. Let us take a look at each of the exceptions listed previously (as above, the Proto-Indo-European reconstructions represent the Phonemic Pitch Stage of Proto-Indo-European ["Pre-Anatolian Proto-Indo-European"]):

A. Hittite *ú-uk-ga* 'I': in this case, we are dealing with a particle added to the stem (cf. Sturtevant 1951:103, §170a), so that, in fact, we have gemination: Proto-Indo-European **ʔek'-+-k'e/a* > Proto-Anatolian **ek+ka* > Hittite (with analogical *u*) **uk+ka*. The particle appears in Greek as -γε (dialectal -γα).
B. Hittite 2 pl. mediopassive ending *-dduma* in, for example, *i-ya-at-du-ma* 'you go': here, the verb stem is probably to be reconstructed as **ʔy-eh-* [*ʔy-ah-] (so Sturtevant 1951:34, §61; Puhvel 1984— .1/2:334—335, however, considers *iya-* to be a thematic stem comparable to Vedic 3 sg. pres. *ayate* and derives it from earlier **eyo-*), to which the ending **-dum-* has been added. Most likely, the second laryngeal (**h*), which was lost as an independent phoneme in Hittite, has merged with the following dental, producing a geminate. Thus, double writing here indicates former presence of a laryngeal, which has left a trace in the gemination of the following stop.
C. Hittite (3 sg. pres.) *píd-da-i*, *pád-da-i* 'to dig': here, we are dealing with a Proto-Indo-European stem **bed-*/**bad-*, to which a laryngeal suffix has been added: **bed-+-H-*. In this case, the laryngeal has merged with the preceding stop, producing a geminate.
D. Hittite (acc.-dat. sg.) *am-mu-uk-ga* 'to me' (also written *am-mu-uk*, *am-mu-ug-ga*, *am-mu-uq-qa*, *am-mu-uk-qa*): as in the first example, we are dealing with a particle that has been added to the stem, thus producing gemination.
E. Hittite (nom. sg.) *me-ik-ki-iš* 'large': this is similar to the third example in that a laryngeal suffix has merged with a preceding stop, producing a geminate: Proto-Indo-European **mek'-+-Hi-* > Hittite **mekkis* (cf. Kimball 1999:261).

5.1.5. CONCLUSIONS

Thus, Sturtevant's Law is to be reinterpreted as follows: double writing of medial stops indicates stop plus something additional, that is, either aspiration or gemination, while single writing of medial stops indicates a plain stop pure and simple. It does not indicate a voicing contrast as traditionally assumed. Kloekhorst (2014b:544—547) likewise interprets the contrast as one of length.

According to Melchert (1994a:21), medial double writing of stops in Hittite indicates fortis (= long) articulation, while single writing indicates lenis (= short) articulation. Similar views are expressed by Kimball (1999:94—95); see also Jäntti 2017. Specifically, Melchert (1994a:117) notes:

> I assume that the PA [= Proto-Anatolian] contrast of voiceless/voiced stops has been reanalyzed in Hittite as one of fortis/lenis, with the realization in medial position being that of long/short. I retain the standard symbols for voiceless and voiced stops for convenience. One important contributing factor in this reanalysis was the devoicing of voiced stops in word-initial position.

Melchert's views are not necessarily incompatible with the conclusions reached here. On fortis/lenis articulation, cf. Laver (1994:344) and Ladefoged—Maddieson (1995:95—99). Both Laver and Ladefoged—Maddieson caution against the careless use of these terms.

5.2. DISINTEGRATING INDO-EUROPEAN

We can say with a reasonable amount of certainty that the form of Proto-Indo-European spoken immediately prior to the emergence of the historically-attested non-Anatolian daughter languages was not a unitary language but, rather, a speech area composed of several closely-related dialect groups (cf. Anthony 2007:39—58; Burrow 1973:12—18; Georgiev 1966:382—396). For excellent summaries of the changes that have occurred in the individual Indo-European daughter languages, cf. Bader [ed.] 1994; Baldi 1983; Birnbaum—Puhvel [eds.] 1966; Fortson 2010:170—471; Lockwood 1970; Ramat—Ramat [eds.] 1998; Voyles—Barrack 2009. For discussions relating to specific problem areas, cf. Meillet 1967a and 1984.

The following changes were common to all of the Disintegrating Indo-European dialects (except where noted):

1. The laryngeals **ʔ* and **h* were lost initially before vowels, while **h̯h* > **h* and **ʕ̯ĥ* > **ĥ* > **h* in the same environment.
2. Next, all medial and final laryngeals merged into **h*.
3. The single remaining laryngeal **h* was then lost initially before vowels (except in Pre-Armenian) and medially between an immediately preceding vowel and a following non-syllabic. This latter change caused compensatory lengthening of preceding short vowels.

4. **h* was preserved in all other positions. **h* had a syllabic allophone, **h̥*, when between two non-syllabics. This syllabic allophone is the traditional schwa primum (**ə*).
5. Glottalization was probably lost in late Disintegrating Indo-European itself just as the individual non-Anatolian daughter languages were beginning to emerge.

The velars developed palatalized allophones when contiguous with front vowels, apophonic **o*, and **y*. The beginnings were probably much earlier, before the separation of the Anatolian dialect group from the main speech community. What is certain here is that the palatovelars were fully established in Disintegrating Indo-European. In a central, innovating area, the labiovelars were (probably only partially at first) delabialized. The newly-delabialized labiovelars merged with the unpalatalized allophones of the velars. This change brought about the phonemicization of the palatals since both palatalized velars (from earlier plain velars) and unpalatalized velars (from earlier labiovelars) were now found in the vicinity of front vowels, apophonic **o*, and **y*. It was from this central, innovating area that the so-called "satəm" daughter languages developed.

The phonological system of the Disintegrating Indo-European antecedent of the satəm daughter languages may be reconstructed as follows (column 1 is voiceless aspirated, column 2 is glottalized, and column 3 is voiced aspirated):

	1	2	3			
Obstruents:	p^h	p’	b^h	(bilabial)		
	t^h	t’	d^h	(dental)		
	k^{yh}	$k’^y$	g^{yh}	(palatovelar)		
	k^h	k’	g^h	(velar)		
	k^{wh}	$k’^w$	g^{wh}	(labiovelar)		
		s				
Laryngeals:		h/h̥				
Resonants:	m/m̥	n/n̥	l/l̥	r/r̥	w/u	y/i
Vowels:	e	o	a	(i)	(u)	ə
	ē	ō	ā	ī	ū	

The most significant difference between the phonological system of the Disintegrating Indo-European antecedent of the satəm dialects and that of the centum dialects was in the treatment of the gutturals. In the centum dialects, the labiovelars did not become delabialized, and the palatovelars remained subphonemic.

The phonological system of the Disintegrating Indo-European antecedent of the centum daughter languages may be reconstructed as follows (column 1 is voiceless aspirated, column 2 is glottalized, and column 3 is voiced aspirated):

	1	2	3			
Obstruents:	p^h	p’	b^h	(bilabial)		
	t^h	t’	d^h	(dental)		
	k^h	k’	g^h	(velar)		
	k^{wh}	$k’^w$	g^{wh}	(labiovelar)		
		s				
Laryngeals:		h/ḫ				
Resonants:	m/m̥	n/n̥	l/l̥	r/r̥	w/u	y/i
Vowels:	e	o	a	(i)	(u)	ə
	ē	ō	ā	ī	ū	

It has traditionally been assumed that column 3 is to be reconstructed as a series of voiced aspirates, and I have chosen to follow the traditional reconstruction. However, it is really only necessary to posit voiced aspirates for Pre-Armenian, Pre-Indo-Iranian, Pre-Greek, and Pre-Italic — the developments in the remaining daughter languages can be accounted for quite nicely by assuming plain voiced stops, as will become apparent by following the developments outlined below. Clearly, the voiced aspirates, regardless of whether they existed in all or merely some of the dialects of Disintegrating Indo-European, are not ancient — they arose in late Disintegrating Indo-European from earlier plain voiced stops.

5.3. TOCHARIAN

In Tocharian, the distinction between voiceless, glottalized, and voiced (traditional voiceless, voiced, and voiced aspirated) stops was eliminated. However, Tocharian originally preserved the older contrast. While this contrast still existed, **t’* was lost before non-syllabic resonants (cf. Van Windekens 1976—1982.I:82—83, §241), while **t^h* and **d* remained. The elimination of the older contrast must, therefore, have taken place after the loss of **t’* before non-syllabic resonants.

1. No doubt, the first step involved the deaspiration of the voiceless aspirates.
2. This was followed by the deglottalization of **p’*, **t’*, **k’*, and **$k’^w$* and their merger with the voiceless stops **p*, **t*, **k*, and **k^w*, respectively. This is shown by the fact that **mp* remained *mp*, while **mb* became *m* (cf. Van Windekens 1976—1982.I:79), and by the fact that **t* and **t’* had the same treatment before front vowels, namely, palatalization to *c*, while **d* went its own way under the same conditions — palatalization to **dz* > *ts* (cf. Van Windekens 1976—1982.I:83—84).
3. Last, the voiced stops were devoiced and merged with the plain voiceless stops.

These developments may be summarized as follows:

I Pre-Tocharian		II deaspiration		III deglottalization		IV devoicing
p^h, p', b	>	p, p', b	>	p, b	>	p (w)
t^h, t', d	>	t, t', d	>	t, d	>	t (c, ts)
k^h, k', g	>	k, k', g	>	k, g	>	k (ç)
k^{wh}, k'^w, g^w	>	k^w, k'^w, g^w	>	k^w, g^w	>	k(w/u) (k, ç)

**s* usually remained but was palatalized to *ṣ* before front vowels. The non-syllabic resonants generally remained.

The Disintegrating Indo-European vowels and diphthongs were greatly modified.

References: Adams 1988:36—42 and 2017a:458—461; Anreiter 1984; Fellner 2006; Gamkrelidze—Ivanov 1995.I:43—44; Hackstein 2017; Krause 1952 and 1955; Krause—Thomas 1960.I:61—68; Malzahn 2010:1—22; Ringe 1996; Van Windekens 1976—1982.I:76—94.

5.4. GERMANIC

Germanic, like Armenian, is extremely conservative in its phonology — the Disintegrating Indo-European consonant system is preserved better in these two branches than in any of the other daughter languages. Unlike Armenian, however, Germanic preserves the older contrast between velars and labiovelars, though, in the course of development, they first became voiceless fricatives and then, at a later date and under certain specific conditions, voiced fricatives (see below for details). Armenian, on the other hand, belongs to the satəm group of languages and is, therefore, descended from that form of Disintegrating Indo-European in which this contrast was replaced by a contrast between palatovelars and plain velars.

In Pre-Proto-Germanic (as in Pre-Proto-Anatolian), the glottalics were deglottalized, resulting in the following system, with the three-way contrast (1) voiceless aspirated ~ (2) plain (unaspirated) voiceless ~ (3) plain voiced:

	1	2	3
Bilabial:	p^h	p	b
Dental:	t^h	t	d
Velar:	k^h	k	g
Labiovelar:	k^{wh}	k^w	g^w

1. The voiceless aspirates (series 1) become voiceless fricatives: **p*^{h}, **t*^{h}, **k*^{h}, **k*^{wh} > **f*, **θ*, **χ*, **χw*, except after **s*-.

2. Later, the resulting voiceless fricatives became the voiced fricatives *β, *$\eth$, *γ, and *γw, respectively, except (A) initially and (B) medially between vowels when the accent fell on the contiguous preceding syllable (Verner's Law). *s was also changed to *z under the same conditions.
3. *b remained initially, in gemination, and after nasals; *d initially, in gemination, and after nasals, *l, *z, and *g; and *g only in gemination and after nasals. In other positions, however, *b, *d, *g were changed into the voiced fricatives *β, *$\eth$, *γ, respectively. *g^w became *γ initially and *w medially (cf. Wright—Wright 1925:131).

The resulting Proto-Germanic consonant system may be reconstructed as follows:

	Stops		Fricatives	
Bilabial:	p	b	f	β
Dental:	t	d	θ	ð
Velar:	k	g	χ	γ
Labiovelar:	kw	(gw)	χw	(γw)

In Germanic, *a and *o merged into *a, and *$\bar{a}$ and *$\bar{o}$ merged into *$\bar{o}$. *e become *i (A) before a nasal plus consonant (*eNC > *iNC) and (B) when *i, *$\bar{\imath}$, or *y followed. *ey became *$\bar{\imath}$. *i was changed to *e and *u to *o when *a, *o, or *e appeared in the following syllable except when a nasal plus consonant intervened. In the sequences *$an\chi$, *$in\chi$, and *$un\chi$, the n was lost, and the vowels were lengthened. *$\underset{\circ}{m}$, *$\underset{\circ}{n}$, *$\underset{\circ}{l}$, and *$\underset{\circ}{r}$ developed into *um, *un, *ul, and *ur, respectively.

The Proto-Germanic vowels and diphthongs may be reconstructed as follows:

Vowels:	i	u	ī	ū
	e		ē	ō
	a			
Diphthongs:	ay	aw	ew	

The consonantal resonants remained unchanged except that final *m became *n. This change is also found in Anatolian, Greek, Celtic, and probably Balto-Slavic.

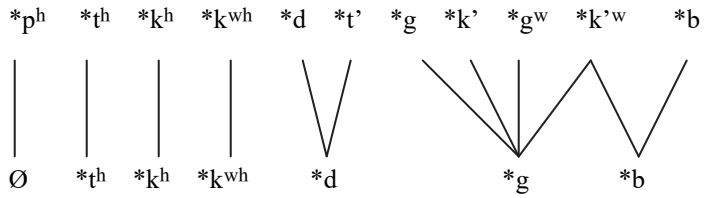
References: Árnason 2011; Bousquette—Salmons 2017:391—398; Gamkrelidze—Ivanov 1995.I:31—36; Harbert 2007:41—88; Hirt 1931—1934.I:79—118; Hutterer 1975; Jasanoff 1978a; König—Van Der Auwera (eds.) 1994; Krahe—Meid 1966—1967.I:79—123; Krause 1968:72—134; Kroonen 2013:xv—xli; Lass 1994:17—29; Lehmann 1952:36—55; Lindeman 1964; Meillet 1967a:116—124, 1970:15—29, and 1984:89—96; Moulton 1972:141—173; Noreen 1894; Normier 1977; Perridon 2008; Prokosch 1939:36—90; Ramat 1998; Fulk 2018:43—137; Ringe 2006; Stiles 2017; Streitberg 1963:97—153; Van Coetsem—Kufner (eds.) 1972; Vennemann 1984; J. Wright 1907:10—164 and 1954:16—83; Wright—Wright 1925:111—134.

5.5. CELTIC

The discussion will be confined to Old Irish; only the major developments will be discussed. For information on developments in the other Celtic daughter languages, the references listed at the end of this section should be consulted.

1. The earlier dental and velar ejectives (**t'* and **k'*) merged completely with the plain voiced stops (**d* and **g*) in Pre-Proto-Celtic. The developments may be assumed to have been ejective > plain voiceless stop (through deglottalization) > voiced stop (through voicing): **t'* > **t* > **d* and **k'* > **k* > **g*. There is no evidence in Proto-Celtic for an earlier bilabial ejective **p'*.
2. Next, the voiced labiovelar **g^w* was delabialized and merged with **g*.
3. Then, the glottalized labiovelar **k'^w* developed (A) into **b* initially and medially after consonants and (B) into **g* initially before **u* and medially between vowels and before consonants.
4. Original **p^h* was lost in all of the Celtic languages: **p^h* > **h* > **Ø*. However, *p* has been reintroduced into Old Irish through loanwords.

The Celtic developments may be summarized as follows:



The consonants developed positional allophones under various conditions:

1. Palatal allophones developed in the vicinity of original **i*, **ī*, **e*, and **ē*.
2. Velar allophones developed in the vicinity of original **u* and **ū*.
3. Neutral allophones were found in the vicinity of original **a*, **ā*, **o*, and **ō*.

In Old Irish, the palatal and velar allophones were indicated as such in writing by surrounding vowels. Unpronounced vowels were often introduced to indicate the quality of the following consonant. /p, t, c, b, d, g/ became the fricatives /f, θ, χ, v, ð, ɣ/ (written *ph*, *th*, *ch*, *b*, *d*, *g*), respectively, initially after words that end or that formerly ended in a vowel and medially between vowels. /m, n, l, r/ became /μ, ν, λ, ρ/ (written *m*, *n*, *l*, *r*), respectively, and /s/ became /h/ under the same conditions. /μ/ was probably a nasalized /v/, while /ν, λ, ρ/ were lax variants of /n, l, r/. Consonants were changed as follows initially when the preceding word ended or formerly ended in a nasal:

1. /p, t, c/ became /b, d, g/ (written *p*, *t*, *c*)
2. /b, d/ first became /mb, nd/ and then /mm, nn/

3. /f/ became /v/ (written *b*)
4. /n/ was written before vowels
5. /s, r, l, m, n/ were doubled when they followed a proclitic vowel

Old Irish thus had the following system of consonants (the written form is given first followed by the allophones in slashes):

p	/p, b/	t	/t, d/	c	/k, g/
ph	/f/	th	/θ/	ch	/χ/
f	/f/	s	/s/		
b	/b, v/	d	/d, ð/	g	/g, ɣ/
m	/m, µ/	n	/n, ν/	[n]	/ŋ/

l	/l, ʎ/	r	/r, ρ/
h	/h/		

Except for the merger of **ō* and **ā* into *á* and of **ī* and **ē* into *í*, the long and short vowels were mostly preserved in accented syllables. In unaccented syllables, vowels were either lost or subject to various modifications governed by a complicated set of rules. **i* and **u* became *e* and *o*, respectively, under the influence of *a* or *o* in the following syllable. **ew* and **ow* merged into *ó*/*úa*, **ey* became *é*/*ía*, **oy* became *óe*/*oí*, and **ay* became *aí*/*áe* in accented syllables. The Old Irish vowel system was as follows:

Vowels:	i	e	a	o	u
	í	é	á	ó	ú
Diphthongs:	íu	ía		úa	uí
		éu/éo		oí/óe	
		áu		ái/áe	

**y* was lost. **w* became *f* initially and *b* /v/ after *r*, *l*, *d*. **m*, **n*, **l*, **r* were preserved except that final **m* became *n*. In the sequences **Vnt*, **Vnc(h)*, and **Vns*, the **n* was lost, and the preceding vowel was lengthened. The developments of the syllabic nasals and liquids were complicated, though, in general, **m̥*, **n̥*, **l̥*, **r̥* became *am*, *an*, *al*, *ar*, respectively, before vowels and *em*, *en*, *li* (*le*), *ri* (*re*), respectively, elsewhere.

References: Old Irish: Lehmann—Lehmann 1975; Lewis—Pedersen 1937:26—56; Thurneysen 1946:74—153; Vendryès 1908:17—36; Windisch 1882:1—39. Welsh: Morris Jones 1913:18—30 and 122—191. British Celtic: Schrijver 1995. Gaulish: Dottin 1920; Whatmough 1970. Celtic: Gamkrelidze—Ivanov 1995.I:66—67; Lewis—Pedersen 1937:1—157; MacAulay (ed.) 1992; Matasović 2009:4—11 and 14—16; Pedersen 1909—1913.I; P. de Bernardo Stempel 1987; Zair 2012. General: Ball—Müller 2009; Eska 2004; P. Sims-Williams 2017:361—367; Stifter 2017.

5.6. SLAVIC

In Pre-Slavic, Pre-Baltic, Pre-Indo-Iranian, Pre-Armenian, and Pre-Albanian (the so-called "satəm" languages), the velars developed palatalized allophones when contiguous with front vowels, apophonic **o*, and **y*. In the early prehistory of these branches, the labiovelars were (perhaps only partially at first) delabialized. The newly delabialized (labio)velars merged with the unpalatalized allophones of the velars. This change brought about the phonemicization of the palatals since both palatalized velars (from earlier plain velars) and unpalatalized velars (from earlier labiovelars) were now found in the vicinity of front vowels, apophonic **o*, and **y*.

The phonological system of Pre-Proto-Slavic may thus be reconstructed as follows (cf. Shevelov 1964:26):

	1	2	3
Bilabial:	p^h	p'	b
Dental:	t^h	t'	d
Palatal:	k^{yh}	k'^y	g^y
Velar:	k^h	k'	g
(Labiovelar:	k^{wh}	k^w	g^w)

1. The ejectives merged completely with the plain voiced stops (**b*, **d*, **g^y*, and **g*) in Pre-Proto-Slavic. The development may be assumed to have been ejective > plain voiceless stop (through deglottalization) > voiced stop (through voicing): **p' > *p > *b*, **t' > *t > *d*, **k'^{y} > *k^y > *g^y*, and **k' > *k > *g*. The loss of glottalization caused lengthening of preceding contiguous short vowels (Winter's Law [cf. Collinge 1985:225—227]).
2. Then, the voiceless aspirates were deaspirated: **p^h*, **t^h*, **k^{yh}*, **k^h > *p*, **t*, **k^y*, **k*. Note: there are a small number of examples in which **k^h* appears to become **x* in Proto-Slavic. These are best explained as borrowings, probably from Iranian (cf. Carlton 1991:95).
3. After **k*, **r*, **i*, **u*, **s* became **x* (> **š* before front vowels). A similar change is found in Indo-Iranian.
4. **k^y* and **g^y* became **s* and **z*, respectively. No doubt, the developments were as follows: **k^y > *t^y > *t͡s > *s* and **g^y > *d^y > *d͡z > *z*.
5. **k* and **g* were palatalized to **č* and **ž*, respectively, before front vowels and **y*.
6. The syllabic resonants **m̥*, **n̥*, **l̥*, **r̥* developed into **i* (or **u*) plus **m*, **n*, **l*, **r*, thus: **m̥*, **n̥*, **l̥*, **r̥ > *im*, **in*, **il*, **ir*.
7. At a later date, **k* and **g* were palatalized to **c* and **dz*, respectively, before **ě* (< **oy*). **t*, **d*, **n*, **l*, **r* plus the semivowel **y* became **t^y*, **d^y*, **n^y*, **l^y*, **r^y*, respectively, while **s* became **š* under the same conditions.
8. **p*, **b*, **m*, **v* plus **y* became **pl^y*, **bl^y*, **ml^y*, **vl^y*, respectively.
9. **a* and **o* merged into **o*, and **ā* and **ō* merged into **a*. **ey* and **ī* both became **i*, and **oy* (< **ay* and **oy*) and **ē* became **ě*. **ū* became **y*, **i*

became *ь, and *u became *ъ. *e plus a nasal became *ę and *o plus a nasal became *ǫ. *ow (< *aw and *ow) became *u.

The Common Slavic phonological system may be reconstructed as follows (cf. M. Greenberg 2017:523 and 533):

Stops:	p	t	tʸ	k		
	b	d	dʸ	g		
Fricatives:	f	s	š	x		
		z	ž	(γ)		
Affricates:		c				
Nasals:	m	n	nʸ			
Liquids:		r	rʸ			
		l	lʸ			
Semivowels:	v		j			
Vowels:			i	y	u	
	ь	ъ			ę	ǫ
	e	o				
			ě	a		

References: Bidwell 1963; Birnbaum 1975b:84—149; Bomhard 1984b:80—81; Carlton 1991; Collins 2018; Comrie—Corbett (eds.) 1993; De Bray 1969, 1980a, 1980b, and 1980c; Derksen 2008:2—22; Entwistle—Morison 1964:71—101; Kortlandt 1994; Leskien 1969:10—64; Lunt 2001:29—51 and 181—221; Meillet 1965a:20—45, 86—102, and 126—157; Schmalstieg 1976a:31—55; Shevelov 1964; Sussex—Cubberley 2006:25—40; Vaillant 1950—1966.I:23—103; Vondrák 1900:32—148 and 1906—1908.I:18—393; Šefčík 2013; M. Greenberg 2017:522—533.

5.7. BALTIC

The Baltic developments were fairly similar to the early Slavic developments, except that *k^y and *g^y became *š and *ž, respectively. As in Pre-Proto-Slavic, the ejectives merged completely with the plain voiced stops in Pre-Proto-Baltic. Lithuanian shows the change of *s to *š after *k and *r but not after *i and *u as in Slavic and Indo-Iranian. The syllabic resonants *m̥, *n̥, *l̥, *r̥ developed into *i (or *u) plus *m, *n, *l, *r, thus: *m̥, *n̥, *l̥, *r̥ > *im, *in, *il, *ir. In Lithuanian, *t* plus *j* (= *y*) and *d* plus *j* (= *y*) became *či* and *dži*, respectively; *t* plus *l* and *d* plus *l* became *kl* and *gl*, respectively.

Except for the merger of *a and *o into *a, *ay and *oy into *ai, and *aw and *ow into *au, the vowel system remained reasonably faithful to that of Disintegrating Indo-European. Unlike Slavic and Germanic, Baltic did not merge Disintegrating Indo-European *ā and *ō.

The Common Baltic phonological system may be reconstructed as follows (cf. Stang 1966:89; S. Young 2017b:496):

p	b	m	
t	d	n	
k	g	[ŋ]	
k^y (?)	g^y (?)	[n^y] (?)	
š	ž		
s	(z)		
r	l	y	w

Note: Stang writes *i̯* and *u̯* for *y* and *w*, respectively.

References: Dini 2014:102—133; Endzelins 1971:48—76; Petit 2018a; Senn 1957—1966:83—90; Stang 1966:88—120; S. Young 2017b:489—499. Baltic developments are also discussed in Meillet 1965a, Shevelov 1964, and Vaillant 1950—1966. For Old Prussian, cf. Schmalstieg 1974a:8—28 and Mažiulis 2004. For Balto-Slavic, cf. Gamkrelidze—Ivanov 1995.I:67—70 and S. Young 2017a.

5.8. ARMENIAN

Armenian is particularly important because it provides the key to understanding the developments in Pre-Indo-Iranian, Pre-Greek, and Pre-Italic. In the early prehistory of Pre-Armenian, Pre-Indo-Iranian, Pre-Greek, and Pre-Italic, the glottalics first became plain voiceless stops (through deglottalization), and the voiced stops then became voiced aspirates. Next, at a later date, in Pre-Indo-Iranian, Pre-Greek, and Pre-Italic, but not in Pre-Armenian, the plain voiceless stops became voiced stops. Armenian, however, preserves the first stage of this shift — that is to say, the plain voiceless stops remained as such and were not changed to voiced stops. Thus, the Classical Armenian phonological system directly attests the three-way contrast (1) voiceless aspirated ~ (2) plain voiceless ~ (3) voiced aspirated in its occlusive system.

1. In Pre-Armenian (as in Pre-Slavic, Pre-Baltic, Pre-Albanian, and Pre-Indo-Iranian), the velars developed palatalized allophones when contiguous with front vowels, apophonic **o*, and **y*. Next, the labiovelars were (perhaps only partially at first) delabialized. The newly delabialized (labio)velars then merged with the unpalatalized allophones of the velars. This change brought about the phonemicization of the palatals since both palatalized velars (from earlier plain velars) and unpalatalized velars (from earlier labiovelars) were now found in the vicinity of front vowels, apophonic **o*, and **y*.
2. Next, the glottalics were deglottalized: **p'*, **t'*, **k'^y*, **k'* > **p*, **t*, **k^y*, **k*. Note: there are no examples of **p'* in Armenian.

3. Then, the plain voiced stops became voiced aspirates: **b*, **d*, **g^{y}*, **g* > **b^{h}*, **d^{h}*, **g^{yh}*, **g^{h}*. This was a context-free development. On the interpretation of the sounds traditionally transcribed as /b/, /d/, /g/, /j/, and /ǰ/ as voiced aspirates, cf. Godel 1975:9—10; Garrett 1998; Schirru 2012. It should be noted that Grassmann's Law did not operate in Armenian (cf. Vennemann 1989:239).
4. The Pre-Armenian voiced aspirates remained except that, medially between vowels, **b^{h}* > *w*, **g^{yh}* > **j^{h}* /d͡z^{h}/ > *z*, and **g^{h}* > *ž*, while **g^{h}* remained initially before back vowels but was changed to *ǰ* /d͡ž^{h}/ before front vowels.
5. The syllabic resonants **m̥*, **n̥*, **l̥*, **r̥* developed into **a* plus **m*, **n*, **l*, **r*, thus: **m̥*, **n̥*, **l̥*, **r̥* > *am*, *an*, *al*, *ar* (*ar̂* before *n*).
6. *l* became *ł* before consonants.
7. **w* became *g* or *v*.
8. **s* became *h* or *Ø* initially before vowels.
9. As in Indo-Iranian, Slavic, and Lithuanian, **s* became *š* after *r*.
10. **sk* and **ks* became *ç*.
11. The short vowels remained unchanged, but **ē* became *i*, **ō* became *u*, and **ā* became *a*. **i*/**ī* and **u*/**ū* lost any distinction of length. **ew* and **ow* became *oy*, **ay* became *ay*, **aw* became *aw*, and **ey* and **oy* became *ē*.

The Armenian developments may be summarized as follows:

I palatalization of velars and delabialization of labiovelars		II deglottalization of ejectives		III development of voiced aspirates		IV Classical Armenian (traditional transcription)
p^{h}, (p'), b	>	p^{h}, p, b	>	p^{h}, p, b^{h}	>	h (w, Ø), -, b (w)
t^{h}, t', d	>	t^{h}, t, d	>	t^{h}, t, d^{h}	>	t^{h}, t, d
k^{yh}, k'^{y}, g^{y}	>	k^{yh}, k^{y}, g^{y}	>	k^{yh}, k^{y}, g^{yh}	>	s, c, j (z)
k^{h}, k', g	>	k^{h}, k, g	>	k^{h}, k, g^{h}	>	k^{h}, k, g (ǰ, ž)

At a later date, earlier clusters of voiceless stop plus laryngeal developed as follows:

pH	>	p^{h}
tH	>	t^{h}
kH	>	x

In Armenian, some of the reflexes of the original voiceless aspirates merged with the reflexes of the new voiceless aspirates. This happened in the case of certain onomatopoeic terms, where, for example, original **p^{h}* and **k^{h}* appear as *p^{h}* and *x*, respectively, as if they were from earlier **pH* and **kH*. In like manner, the aspiration of the original voiceless aspirates was preserved in Armenian after initial **s-* (a similar development took place in Indo-Iranian). Finally, **t^{h}* and **tH* have

mostly merged in Armenian, though earlier **rt^h* has become *rd*, while **rtH* has become *rt^h* (cf. Meillet 1967a:104—105 and 1984:78—79).

Armenian is the only non-Anatolian daughter language that has preserved a trace of a consonantal laryngeal. Kuryłowicz's **ə$_2$* (Sturtevant's **x*) appears as *h* initially before full-grade vowels in a small number of words (cf. Austin 1942:22—25; Bomhard 1976:231—232, 1979a:87—88, and 1984b:82—83; Greppin 1981: 120—122; Polomé 1980:17—33; Sturtevant 1942:29—30; Winter 1965b:102). The following examples have cognates in the Anatolian languages:

1. Armenian *hav* 'grandfather' (< Pre-Armenian **hawhos*): Hittite *ḫuḫḫaš* 'grandfather'; Hieroglyphic Luwian *huhas* 'grandfather'; Lycian *χuga-* 'grandfather'. Cf. Latin *avus* 'grandfather'; Gothic *awō* (f.) 'grandmother'; Old Irish *áue* 'grandson'; Lithuanian *avýnas* 'uncle'. Puhvel 1984— .3:355—358; Kloekhorst 2008b:352—353.
2. Armenian *hoviw* 'shepherd' (< Pre-Armenian **howi-pā-*): Hittite (nom. sg. or pl. ?) *ḫa-a-u-e-eš* 'sheep'; Luwian *ḫa-a-ú-i-iš* 'sheep'; Hieroglyphic Luwian *hawis* 'sheep'; Lycian *χava* 'sheep'. Cf. Sanskrit *ávi-ḥ* 'sheep'; Greek ὄϊς, οἶς 'sheep'; Latin *ovis* 'sheep'; Lithuanian *avìs* 'sheep'. Puhvel 1984— .3:279—280; Kloekhorst 2008b:337—338.
3. Armenian *haravunk^h* 'arable land' (< Pre-Armenian **har-* 'to plow'): Hittite *ḫarašzi* 'to plow'. Cf. Greek ἀρόω 'to plow, to till'; Latin *arō* 'to plow, to till'; Gothic *arjan* 'to plow'; Lithuanian *ariù* 'to plow, to till'; Tocharian B *āre* 'plow'. But note Armenian *arawr* 'plow' without initial *h*. On the other hand, Puhvel (1984— .3:184—185) derives the Hittite form from Akkadian *ḫarāšu* 'to plant' or *ḫarāṣu* 'to dig a furrow'; but cf. Tischler 1977— :182—183; Kloekhorst 2008b:312—314.
4. Armenian *hogi* 'wind, spirit' (< Pre-Armenian **howyo-*), *hov* 'wind', *hovem* 'to let air in': Hittite *ḫuwanza* 'wind'. Cf. Sanskrit *vā́ti* 'to blow'; Greek ἄημι 'to blow, to breathe'; Latin *ventus* 'wind'; Gothic *winds* 'wind'; Tocharian A *want* 'wind'; Lithuanian *vė̃jas* 'wind'. Puhvel 1984— .3:428—429; Kloekhorst 2008b:368.
5. Armenian *han* 'grandmother' (< Pre-Armenian **hano-s*): Hittite *ḫannaš* 'grandmother'; Lycian *χñna-* or *χñni-* 'grandmother'. Cf. Latin *anus* 'old woman'; Old High German *ana* 'grandmother'. Puhvel 1984— .3:84—86; Kloekhorst 2008b:285—286.
6. Armenian *harkanem* 'to split, to fell' (< Pre-Armenian **hark'-*): Hittite *ḫarakzi* 'to be destroyed'. Cf. Old Irish *orgaim* 'to strike, to destroy'. This etymology is rejected by Puhvel 1984— .3:157—168; but cf. Kloekhorst 2008b:306—307; Benveniste 1935:162.
7. Armenian *haçi* 'ash-tree' (< Pre-Armenian **hask^{y}o-*): Hittite ^{GIŠ}*ḫaššikka-* 'a tree and its fruit (?)'. Cf. Old Icelandic *askr* 'ash-tree'; Old High German *ask* 'ash-tree' (< Proto-Germanic **aski-z*). This comparison is not mentioned in Puhvel 1984— .3:232; but cf. Tischler 1977— :200—201.
8. Armenian *Hay* 'Armenian': Hittite *Ḫayaša* the name of a region (cf. Meillet 1936:9). No doubt this term has been borrowed by Armenian.

The following examples have no known Anatolian cognates:

1. Armenian *hav* ‘bird’ (< Pre-Armenian **hawi-s*): Latin *avis* ‘bird’; Sanskrit *ví-ḥ* ‘bird’.
2. Armenian *hot* ‘smell’ (< Pre-Armenian **hot'os-*): Latin *odor* ‘smell’; Greek ὄζω ‘to smell’.
3. Armenian *hum* ‘raw’ (< Pre-Armenian **hōmo-s*): Sanskrit *āmá-ḥ* ‘raw’; Greek ὠμός ‘raw’.

The Armenian material is not without problems, however. Both Meillet (1936:38) and Winter (1965b:102) point out that initial *h* is unstable. This means that the same word sometimes has two alternates, one with *h-* and one without — Meillet’s example is *hogi* ‘wind, spirit’ beside *ogi*. Furthermore, *h-* is sometimes missing where the Hittite cognate unequivocally points to original **$\underset{\smile}{ħh}$* (= **$ə_2$*) such as in Armenian *arcat^h* ‘silver’ beside Hittite *ḫarkiš* ‘white’ (other cognates include Greek ἀργός ‘bright, white’ and Latin *argentum* ‘silver’). Consequently, the Armenian material, though extremely valuable, must be used with caution.

The Neogrammarians and their followers — with the exception of Ferdinand de Saussure — did not reconstruct laryngeals as part of the Proto-Indo-European phonological system. However, they had all of the tools at their disposal to do so. First of all, as early as 1878, de Saussure had posited his now famous “coefficients sonantiques” solely on the basis of an analysis of the patterns of vowel gradation. Secondly, Armenian has a clear reflex of one of de Saussure’s “coefficients”. Unfortunately, the Armenian evidence escaped detection until after the discovery in 1927 by Kuryłowicz that one of de Saussure’s “coefficients” was preserved in Hittite. It was only then that the Armenian material was re-examined by Austin (1942:22—25) and the laryngeal reflex found. It should be noted that Albert Cuny made the same discovery at the same time (1927) as Kuryłowicz.

References: Gamkrelidze—Ivanov 1995.I:36—40; Garrett 1998; Godel 1975:9—10 and 61—91; Macak 2017; Meillet 1936:23—40; Olsen 2017a:423—434; Ravnæs 1991; Schirru 2012; Winter 1965a:109—115; Schmitt 1981:34—79; Vaux 1998; Fleming 2000.

5.9. INDO-IRANIAN

The changes leading from Proto-Indo-European to Proto-Indo-Iranian are particularly complicated. The first three steps are identical to what is assumed to have happened in Pre-Armenian (and also Pre-Greek and Pre-Italic).

1. In Pre-Indo-Iranian (as in Pre-Slavic, Pre-Baltic, Pre-Albanian, and Pre-Armenian), the velars developed palatalized allophones when contiguous with front vowels, apophonic **o*, and **y*. Next, the labiovelars were (perhaps only partially at first) delabialized. The newly delabialized (labio)velars then merged

with the unpalatalized allophones of the velars. This change brought about the phonemicization of the palatals since both palatalized velars (from earlier plain velars) and unpalatalized velars (from earlier labiovelars) were now found in the vicinity of front vowels, apophonic *o, and *y.

2. Next, the glottalics were deglottalized: *p', *t', *k'^{y}, *k' > *p, *t, *k^{y}, *k.
3. Then, the plain voiced stops became voiced aspirates: *b, *d, *g^{y}, *g > *b^{h}, *d^{h}, *g^{yh}, *g^{h}. This was a context-free development. This was the stage reached by Armenian.
4. When two voiced aspirates cooccurred in a root, the first was deaspirated (Grassmann's Law). It should be noted that Grassmann's Law only appears in Indo-Aryan. In Iranian (Old Persian and Avestan), the plain voiced stops and the voiced aspirates have the same treatment (cf. Kent 1953:29).
5. In Pre-Indo-Iranian (and in Pre-Greek and Pre-Italic), but unlike Pre-Armenian, the plain (unaspirated) voiceless stops (from earlier glottalics) developed into plain (unaspirated) voiced stops: *p, *t, *k^{y}, *k > *b, *d, *g^{y}, *g. This was a context-free development. (An identical change has taken place in Kabardian.)
6. The imbalance caused by the voicing of the plain voiceless stops caused the voiceless aspirates to be partially deaspirated. The deaspiration took place everywhere except (A) after initial *s- and (B) in onomatopoeia (cf. Bomhard 1986a:73). However, aspiration was lost in the clusters *sp^{h}-, *st^{h}-, *sk^{h}- when an earlier laryngeal followed in the stem or when another aspirated stop followed in the stem: *$(s)t^{h}eHy$- > *$(s)teHy$- > *$(s)t\bar{a}y$- (cf. Sanskrit *stāyati* 'he, she steals', *stāyú-ḥ*, *tāyú-ḥ* 'thief, robber'); *$(s)t^{h}eHi$- > *$(s)teHi$- > *$(s)tai$- (cf. Sanskrit *stená-ḥ* 'thief', *stéya-ḥ* 'theft, robbery'). *$(s)t^{h}enH$- > *$(s)tenH$- > *$(s)ten$- (cf. Sanskrit *stanati* 'resounds, reverberates'). Note: Apparent exceptions to these rules appear to be due to the generalization of variant forms of the stems in question, or, in some cases, they are due to borrowing.
7. Additional voiceless aspirates arose from earlier clusters of voiceless stop plus laryngeal: *pH, *tH, *kH > *p^{h}, *t^{h}, *k^{h}, respectively.
8. *s was changed into *$š$ after *k, *r, *i, *u. A similar change is also found in Slavic.
9. *k^{y}, *g^{y}, *g^{yh} were affricated to *$t\underset{\frown}{s}$, *$d\underset{\frown}{z}$, *$d\underset{\frown}{z}^{h}$, respectively (cf. Burrow 1973:74).
10. Following that, the velars *k, *g, *g^{h} were palatalized to *k^{y}, *g^{y}, *g^{yh}, respectively, before *$ĕ$, *$ĭ$, and *y (cf. Mayrhofer 1972:24). Note: *k^{h} was not palatalized.
11. After the palatalization of the velars had taken place, the short vowels merged into *a, and the long vowels merged into *$ā$. Original *o became $ā$ in open syllables (Brugmann's Law).
12. The syllabic nasals became a, and the syllabic laryngeal (*$\underset{\circ}{h}$) partially merged with i.
13. *h was then lost after a (< *$\underset{\circ}{m}$ and *$\underset{\circ}{n}$) with compensatory lengthening.
14. *r and *l merged into r, and *$\underset{\circ}{r}$ and *$\underset{\circ}{l}$ merged into $\underset{\circ}{r}$.

The developments outlined above may be summarized as follows:

	I palatalization of velars and delabialization of labiovelars		II deglottalization of ejectives		III development of voiced aspirates	
Bilabial:	p^h, p’, b	>	p^h, p, b	>	p^h, p, b^h	>
Dental:	t^h, t’, d	>	t^h, t, d	>	t^h, t, d^h	>
Palatal:	k^{yh}, k’^{y}, g^y	>	k^{yh}, k^y, g^y	>	k^{yh}, k^y, g^{yh}	>
Velar:	k^h, k’, g	>	k^h, k, g	>	k^h, k, g^h	>

IV voicing of plain (unaspirated) voiced stops		V partial deaspiration of voiceless aspirates		VI palatals become affricates		VII partial palatalization of velars
p^h, b, b^h	>	p, p^h, b, b^h	>	p, p^h, b, b^h	>	p, p^h, b, b^h
t^h, d, d^h	>	t, t^h, d, d^h	>	t, t^h, d, d^h	>	t, t^h, d, d^h
k^{yh}, g^y, g^{yh}	>	k^y, k^{yh}, g^y, g^{yh}	>	t͡s, -, d͡z, d͡z^h	>	t͡s, -, d͡z, d͡z^h
k^h, g, g^h	>	k, k^h, g, g^h	>	k, k^h, g, g^h	>	k^y, -, g^y, g^{yh} (before *ĕ, *ĭ, *y) k, k^h, g, g^h (elsewhere)

In Avestan and Old Persian, the plain and aspirated voiced stops merged. The voiceless aspirates became fricatives except after a sibilant, where they were deaspirated. The plain voiceless stops developed into fricatives when immediately followed by a consonant unless a sibilant preceded.

In Old Indic (Vedic and Classical Sanskrit), **d͡z* and **g^y* merged into *j*, and **d͡z^h* and **g^{yh}* merged into *h*.

The Old Indic phonological system was as follows (cf. Burrow 1973:67—117; Ghatage 1962:71; Gonda 1966:9—10; Mayrhofer 1972:17; Thumb 1958—1959. I/1:188—197; Whitney 1889:2—3):

Velar:	k क	kh ख	g ग	gh घ	ṅ ङ
Palatal:	c च	ch छ	j ज	jh झ	ñ ञ
Retroflex:	ṭ ट	ṭh ठ	ḍ ड	ḍh ढ	ṇ ण
Dental:	t त	th थ	d द	dh ध	n न
Bilabial:	p प	ph फ	b ब	bh भ	m म
Semivowels:	y य	r र	l ल	v व	
Sibilants:	ś श	ṣ ष	s स		
Aspirate:	h ह				
Visarga:	ḥ ः				
Anusvāra:	ṁ ं				

Vowels:	a	अ	i	इ	u	उ	r̥	ऋ	l̥	ऌ	e	ए	o	ओ
	ā	आ	ī	ई	ū	ऊ	r̥̄	ॠ						
Diphthongs:	ai	ऐ	au	औ										

Once the above system was established, it remained remarkably stable for well over three thousand years — the phonological systems of the modern Indo-Aryan languages remain to this day similar in structure to the phonological system of Old Indic (cf. Bloch 1965:96—97; see Ghatage 1962 for examples). This fact raises an interesting question about the phonological system reconstructed for the Indo-European parent language by the Neogrammarians: The Neogrammarian reconstruction is extremely close to the phonological system of Old Indic. If the Neogrammarian system were in fact an accurate representation of what had existed in Proto-Indo-European, one may legitimately ask why it, too, did not remain stable in the majority, if not all, of the Indo-European daughter languages. It thus seems to be a fair conclusion that the Proto-Indo-European phonological system was not in fact similar to that of Old Indic and that the Old Indic system was an innovation.

References: Indo-Iranian: Gray 1902; Kuz′mina 2007. Indo-Aryan: W. S. Allen 1953; Burrow 1973:67—117 and 1979; Cardona—Jain (eds.) 2003; Edgerton 1946; Ghatage 1962; Gonda 1966:9—19; Katre 1968; Kobayashi 2004 and 2017; Kulikov 2017b:221—229; MacDonell 1916:1—47; Masica 1991; Mayrhofer 1972:20—29; Renou 1952:23—68; Thumb 1958—1959.I/1:276—315; Whitney 1889:1—73; Ulhenbeck 1898; Wackernagel 1896. Iranian: Beekes 1988a:70—103 and 1997:1—26; Cantera 2017; De Vaan 2003; De Vaan—Lubotsky 2012; Jackson 1968:1—61; Meillet 1915; Johnson 1917:67—89; Kent 1953:29—42; Martínez—De Vaan 2014:7—37; N. Sims-Williams 2017:266—274; Testen 1997; Skjærvø 2007.

5.10. GREEK

Many of the early Pre-Greek developments were similar to what is assumed to have happened in Pre-Armenian and Pre-Indo-Iranian. However, Greek is a so-called “centum” language, which means that it initially preserved the original contrast between velars and labiovelars. Unlike Pre-Armenian and Pre-Indo-Iranian, but similar to Italic, Greek changed the voiced aspirates into voiceless aspirates.

1. First, the glottalics were deglottalized: **p’*, **t’*, **k’*, **k’^{w}* > **p*, **t*, **k*, **k^{w}*.
2. Then, the plain voiced stops became voiced aspirates: **b*, **d*, **g*, **g^{w}* > **b^{h}*, **d^{h}*, **g^{h}*, **g^{wh}*. This was a context-free development.
3. As in Old Indic (but not Iranian), when two voiced aspirates cooccurred in a root, the first was deaspirated (Grassmann’s Law).
4. In Pre-Greek (and in Pre-Indo-Iranian and Pre-Italic), but unlike Pre-Armenian, the plain (unaspirated) voiceless stops (from earlier glottalics) developed into plain (unaspirated) voiced stops: **p*, **t*, **k*, **k^{w}* > **b*, **d*, **g*, **g^{w}* (cf. Gamkrelidze—Ivanov 1995.I:52—57). This was a context-free development.

5. The imbalance caused by the voicing of the plain voiceless stops caused the voiceless aspirates to be partially deaspirated. Note: Emonds (1972:120) also assumes that some of the examples of voiceless aspirates found in Indo-Iranian, Greek, and Armenian are derived from the original voiceless aspirates, that is to say, they failed to undergo the expected deaspiration. Edmonds accounts for this by "reintroduction from a dialect that did not undergo Z2 [deaspiration]". In other words, he sees them as borrowings. While this may be true in some cases, I prefer to see them mostly as the natural result of developments within these branches themselves.
6. Additional voiceless aspirates arose from earlier clusters of voiceless stop plus laryngeal: *pH, *tH, *kH > *p^h, *t^h, *k^h, respectively.
7. At a later date, the voiced aspirates were devoiced — the unaspirated allophones became plain (unaspirated) voiceless stops, and the aspirated allophones became voiceless aspirates: *b ~ *b^h, *d ~ *d^h, *g ~ *g^h, *g^w ~ *g^{wh} > *p ~ *p^h, *t ~ *t^h, *k ~ *k^h, *k^w ~ *k^{wh}. The newly-formed plain and aspirated voiceless stops merged completely with the previously-existing plain and aspirated voiceless stops. As a typological parallel, it may be noted that similar devoicing of earlier voiced aspirates took place in Romany (cf. Meillet 1967a:100 and 1984:76).

The Greek developments may be summarized as follows:

	I deglottalization of ejectives		II development of voiced aspirates		III voicing of plain (unaspirated) voiced stops	
Bilabial:	p^h, p, b	>	p^h, p, b^h	>	p^h, b, b^h	>
Dental:	t^h, t, d	>	t^h, t, d^h	>	t^h, d, d^h	>
Velar:	k^h, k, g	>	k^h, k, g^h	>	k^h, g, g^h	>
Labiovelar:	k^{wh}, k^w, g^w	>	k^{wh}, k^w, g^{wh}	>	k^{wh}, g^w, g^{wh}	>

	IV partial deaspiration of voiceless aspirates		V devoicing of voiced aspirates
	p, p^h, b, b^h	>	p, p^h, b
	t, t^h, d, d^h	>	t, t^h, d
	k, k^h, g, g^h	>	k, k^h, g
	k^w, k^{wh}, g^w, g^{wh}	>	k^w, k^{wh}, g^w

The labiovelars were eliminated in Greek in historic times. The process of elimination probably occurred in several stages. Since the labiovelars mostly remain

in Mycenaean, their elimination can reasonably be placed between the Mycenaean period and the beginning of the alphabetic period, that is, between about 1400—900 BCE (cf. Lejeune 1972:43—53). The developments were as follows:

1. Before or after *u*, **k*^{w}, **k*^{wh}, and **g*^{w} were delabialized, and the resulting phonemes merged with *k*, *k*^{h}, and *g* (written κ, χ, and γ), respectively.
2. Next, **k*^{w}, **k*^{wh}, and **g*^{w} were palatalized before *ĕ* and *ĭ*. The resulting sounds then merged with *t*, *t*^{h}, and *d* (written τ, θ, and δ), respectively, in the majority of Greek dialects.
3. Finally, all remaining labiovelars became bilabials: **k*^{w}, **k*^{wh}, and **g*^{w} > *p*, *p*^{h}, and *b* (written π, φ, and β).

**m*, **n*, **l*, **r* generally remained in Greek except that final *-*m* became -*n* (written ν) as in Anatolian, Germanic, Celtic, and probably Baltic and Slavic. **m̥*, **n̥*, **l̥*, **r̥* developed into αμ, αν, αλ, αρ, respectively, before vowels. Before consonants, **m̥* and **n̥* merged into α, while **l̥* and **r̥* became αλ/λα and αρ/ρα, respectively.

**s*, **y*, and **w* were lost medially between vowels. Initially before vowels, **s* became *h* (written ʽ), **y* became either *h* or *z* (written ʽ and ζ, respectively), while **w* was lost in Attic-Ionic. **s* remained when final and when before or after voiceless stops.

The vowels and diphthongs were well-preserved in all of the Greek dialects. The most important change was that of ᾱ to η in Attic-Ionic. Additional changes worth mentioning include the compensatory lengthening of short vowels, the shortening of long vowels, and the development of new long vowels through contraction. For details about these developments, cf. Lejeune 1972:187—263.

References: W. S. Allen 1974; Bubenik 2017; Brugmann 1900:23—159; Buck 1933:78—161; Gamkrelidze—Ivanov 1995.I:52—57; Giannakis (ed.) 2014; Grammont 1948; Hirt 1902:43—200; Horrocks 2010; Lejeune 1972; Meillet—Vendryès 1968:40—68; Palmer 1980:223—241; Rix 1992:29—97; Schwyzer 1953.I:169—371; Sturtevant 1940; Sihler 1995:35—242; Thompson 2017:291—297; J. Wright 1912:5—116.

5.11. ITALIC

Italic is divided into two distinct branches, namely, Oscan-Umbrian (also called Sabellian or Sabellic) and Latin-Faliscan. The Oscan-Umbrian branch includes a number of poorly-attested languages besides Oscan and Umbrian — these include Aequian, Marrucinian, Marsian, Paelignian, Sabinian, Southern Picenian, Vestinian, and Volscian (cf. Sihler 1995:14). The differences between Oscan-Umbrian, on the one hand, and Latin-Faliscan, on the other, are extremely pronounced, so much so that some scholars deny any special relationship between these two groups and see them instead as two separate branches of Indo-European (for a discussion of the issues involved, cf. Beeler 1966:51—58).

Many of the early Pre-Italic developments were similar to what is assumed to have happened in Pre-Greek. Like Greek, Italic belonged to the so-called "centum" languages, which means that it initially preserved the original contrast between velars and labiovelars.

1. First, the glottalics were deglottalized: **p'*, **t'*, **k'*, **k'^{w}* > **p*, **t*, **k*, **k^{w}*.
2. Then, the plain voiced stops became voiced aspirates: **b*, **d*, **g*, **g^{w}* > **b^{h}*, **d^{h}*, **g^{h}*, **g^{wh}*. This was a context-free development. Note: Grassmann's Law did not operate in Italic.
3. In Pre-Italic (and in Pre-Indo-Iranian and Pre-Greek), but unlike Pre-Armenian, the plain (unaspirated) voiceless stops (from earlier glottalics) developed into plain (unaspirated) voiced stops: **p*, **t*, **k*, **k^{w}* > **b*, **d*, **g*, **g^{w}* (cf. Gamkrelidze—Ivanov 1995.I:57—65). This was a context-free development.
4. The imbalance caused by the voicing of the plain voiceless stops caused the voiceless aspirates to be partially deaspirated.
5. Additional voiceless aspirates arose from earlier clusters of voiceless stop plus laryngeal: **pH*, **tH*, **kH* > **p^{h}*, **t^{h}*, **k^{h}*, respectively.
6. At a later date, the voiced aspirates were devoiced: **b^{h}*, **d^{h}*, **g^{h}*, **g^{wh}* > **p^{h}*, **t^{h}*, **k^{h}*, **k^{wh}*. The newly-formed aspirated voiceless stops merged completely with the previously-existing aspirated voiceless stops.
7. Finally, the voiceless aspirates (from earlier voiced aspirates as well as from clusters of voiceless stop plus laryngeal) became voiceless fricatives.

The Italic developments may be summarized as follows:

	I deglottalization of ejectives		II development of voiced aspirates		III voicing of plain (unaspirated) voiced stops	
Bilabial:	p^{h}, p, b	>	p^{h}, p, b^{h}	>	p^{h}, b, b^{h}	>
Dental:	t^{h}, t, d	>	t^{h}, t, d^{h}	>	t^{h}, d, d^{h}	>
Velar:	k^{h}, k, g	>	k^{h}, k, g^{h}	>	k^{h}, g, g^{h}	>
Labiovelar:	k^{wh}, k^{w}, g^{w}	>	k^{wh}, k^{w}, g^{wh}	>	k^{wh}, g^{w}, g^{wh}	>

IV partial deaspiration of voiceless aspirates		V devoicing of voiced aspirates		VI voiceless aspirates become voiceless fricatives
p, p^{h}, b, b^{h}	>	p, p^{h}, b	>	p, f, b
t, t^{h}, d, d^{h}	>	t, t^{h}, d	>	t, θ, d
k, k^{h}, g, g^{h}	>	k, k^{h}, g	>	k, χ, g
k^{w}, k^{wh}, g^{w}, g^{wh}	>	k^{w}, k^{wh}, g^{w}	>	k^{w}, χ^{w}, g^{w}

In Oscan and Umbrian, **f*, **θ*, and **χ^w* merged into *f*, while **χ* became *h*. In Latin, the merger of **f*, **θ*, and **χ^w* into *f* only took place initially. **f* became *b* medially; **θ* became (A) *d* medially but (B) *b* before or after *r*, before *l*, or after *u*; and **χ^w* became (A) *v* between vowels, (B) *gu* after *n*, but (C) *g* before consonants or *u*. **χ* became (A) *h* initially in Latin but (B) *g* when before or after consonants and (C) *f* when before *u*.

**m*, **n*, **l*, **r* were preserved. **y* remained initially in Latin (written *i*) but was lost between vowels, while **w* (written *v*) was unchanged. **m̥*, **n̥*, **l̥*, **r̥* developed into *a* plus *m*, *n*, *l*, *r*, respectively, before vowels. Elsewhere, **l̥* and **r̥* became *ol* and *or*, respectively, and **m̥* and **n̥* became *em* and *en*, respectively.

**s* generally remained, though it was voiced to *z* between vowels. The *z* was retained in Oscan but was changed to *r* in Umbrian and Latin.

The vowels generally remained in accented syllables but were weakened or lost in unaccented syllables. The vowels underwent the following modifications in Latin (cf. Buck 1933:78—117). Final *i* became *e*. *e* became *i* before *ng*, *gn*, *nc*, and *ngu*. *e* became *o* before or after *w* and before *l*. *o* became *u* (1) before *nc*, *ngu*, *mb*, and before *l* plus a consonant, (2) in final syllables ending in a consonant, and (3) medially before *l* or before two consonants. *vo* became *ve* before *r* plus a consonant, before *s* plus a consonant, and before *t*. *ov* became *av*.

The diphthongs were preserved in Oscan but underwent various changes in Umbrian and Latin. *ei* became *ī*, and *oi*, *eu*, and *ou* became *ū* in Latin.

References: Italic: Baldi—Johnston-Staver 1989; Gamkrelidze—Ivanov 1995.I: 57—65; Stuart-Smith 2004. Latin: W. S. Allen 1978; Baldi 1999; Buck 1933:78—161 (Greek and Latin); Kurzová 1993; Leumann—Hoffmann—Szantyr 1963—1965.I:55—180; Lindsay 1894:219—315; Meillet—Vendryès 1968:69—93 (Greek and Latin); Meiser 1998, 2006, 2010, and 2017; Nierdermann 1906; Palmer 1954:211—232; Sihler 1995:35—242 (Greek and Latin); Solmsen 1894; Sommer 1902:34—336; Sturtevant 1940 (Greek and Latin); Wallace 2017:325—329; Weiss 2009a. Oscan and Umbrian: Buck 1928:22—112; Conway 1897; Poultney 1959: 25—84; Von Planta 1892—1897.I:41—600; Wallace 2004a and 2007. Romance languages: Alkire—Rosen 2010; Elcock 1960; Harris—Vincent (eds.) 1988 and 1997; Mendeloff 1969; Meyer-Lübke 1901; Posner 1996. General: Devoto 1978.

5.12. ALBANIAN

Though the Albanian developments are still not completely understood, some tentative conclusions are possible.

1. In Pre-Albanian (as in Pre-Slavic, Pre-Baltic, Pre-Indo-Iranian, and Pre-Armenian), the velars developed palatalized allophones when contiguous with front vowels, apophonic **o*, and **y*. In the early prehistory of these branches, the labiovelars were (perhaps only partially at first) delabialized. The newly delabialized (labio)velars merged with the unpalatalized allophones of the

velars. This change brought about the phonemicization of the palatals since both palatalized velars (from earlier plain velars) and unpalatalized velars (from earlier labiovelars) were now found in the vicinity of front vowels, apophonic **o*, and **y*. Note: Albanian provides the strongest evidence for the existence of three distinct guttural series in its Disintegrating Indo-European ancestor: the labiovelars are distinguished from the plain velars by the fact that the former are palatalized to sibilants before front vowels, while the latter are not (cf. Mann 1977:24—25 and 34—35).

2. The ejectives were deglottalized: **p'*, **t'*, **k'^{y}*, **k'*, **k'^{w}* > **p*, **t*, **k^{y}*, **k*, **k^{w}*.
3. Then, the palatals became palatalized alveolars: **k^{yh}*, **k^{y}*, **g^{y}* > **t^{yh}*, **t^{y}*, **d^{y}*. These later developed into voiceless and voiced interdental fricatives.
4. Next, the plain voiceless stops (from earlier ejectives) became plain voiced stops: **p*, **t*, **k^{y}*, **k*, **k^{w}* > **b*, **d*, **g^{y}*, **g*, **g^{w}*. In general, the developments of the plain voiced stops and the former ejectives are identical, though initial **g^{y}* (> **d^{y}*) appears as *d*, while initial **k'^{y}* appears as *dh* (cf. Mann 1977:33). This seems to indicate that the bilabial and dental stops may have developed ahead of and slightly differently from the palatal, velar, and labiovelar stops.
5. Finally, the voiceless aspirates were deaspirated: **p^{h}*, **t^{h}*, **t^{yh}*, **k^{h}* > **p*, **t*, **t^{y}*, **k*.

The Albanian developments may be summarized as follows:

	I palatalization of velars and (partial) delabialization of labiovelars		II deglottalization of ejectives		III palatals become palatalized alveolars	
Bilabial:	p^{h}, (p'), b	>	p^{h}, p, b	>	p^{h}, p, b	>
Dental:	t^{h}, t', d	>	t^{h}, t, d	>	t^{h}, t, d	>
Palatal:	k^{yh}, k'^{y}, g^{y}	>	k^{yh}, k^{y}, g^{y}	>	t^{yh}, t^{y}, d^{y}	>
Velar:	k^{h}, k', g	>	k^{h}, k, g	>	k^{h}, k, g	>
Labiovelar:	k^{wh}, k'^{w}, g^{w}	>	k^{wh}, k^{w}, g^{w}	>	k^{wh}, k^{w}, g^{w}	>

	IV voicing of voiceless stops		V deaspiration of voiceless aspirates		VI Albanian
	p^{h}, b	>	p, b	>	p, b
	t^{h}, d	>	t, d	>	t, d
	t^{yh}, d$^{y}_{1}$, d$^{y}_{2}$	>	t^{y}, d$^{y}_{1}$, d$^{y}_{2}$	>	th, d (dh), dh
	k^{h}, g	>	k, g	>	k (q), g (gj)
	k^{wh}, g^{w}	>	k^{w}, g^{w}	>	k (q, s), g (gj, z)

References: Camaj 1984:1—8; De Vaan 2018; Hamp 1965a; Huld 1984:138—157; Mann 1977:24—25 and 32—36; Orël 2000:1—122; Rusakov 2017:560—572; Vermeer 2008.

5.13. PHRYGIAN AND THRACIAN

Like Germanic and Armenian, Phrygian is usually assumed to be a relic area in which the Proto-Indo-European stop system is better preserved than it is in the remaining daughter languages (cf. Gamkrelidze—Ivanov 1995.I:804—805). Unfortunately, the Phrygian corpus is so small that it is not possible to trace all of the developments. However, the following developments are clear (except as noted) (cf. Diakonoff—Neroznak 1985:5—6; Fortson 2010:461—462; Georgiev 1981: 131—132; Ligorio—Lubotsky 2013:184—187 and 2018:1821—1824; Neroznak 1992:272—274; R. Woodhouse 2006 and 2010):

Proto-Indo-European		Phrygian
b	>	b
p^h	>	p (also ph)
d	>	d
t^h	>	t (also th)
t’	>	t
g, g^w	>	g
k^h, k^{wh}	>	k (also kh)
k’, k’^{w}	>	k
g^y	>	z (?)
k^y	>	s (?)
k’^{y}	>	z (?)

Note: The reflexes of the palatovelars are unclear. According to Fortson (2010: 461), Phrygian appears to be a centum language.

As can be seen, the voiced stops remained unchanged. The voiceless aspirates also remained unchanged, though the aspiration is usually not indicated in the writing. Finally, the glottalics were simply deglottalized. It should be mentioned, however, that this interpretation is challenged by Brixhe (1994:171—172 and 2004:782).

Phrygian had five short vowels (*a*, *e*, *i*, *o*, *u*) and at least four long vowels (*ā*, *ī*, *ō*, *ū*), though the long vowels were not indicated in the writing. Proto-Indo-European **ē* and **ā* merged into *ā* in Phrygian.

The Thracian developments appear to be similar to those given above for Phrygian (cf. Georgiev 1981:118—119; see also Brixhe—Panayotou 1994a:198—199; Katičić 1976.I:128—153), though this interpretation has recently been called into question by the work of Svetlana Yanakijeva.

5.14. ACCENTUATION IN THE DAUGHTER LANGUAGES

A. SANSKRIT: Vedic Sanskrit (Old Indic), like Ancient Greek, had a system of accentuation in which pitch (*svara-* 'accent, pitch, tone') was dominant. Every word, except certain enclitics, bore an accent; however, there was only one accented syllable per word. The accented syllable had high pitch (*udātta-* 'raised, elevated, high'). All other syllables had low pitch (*anudātta-* 'not raised') except (1) the syllable directly preceding the *udātta-*, which was pronounced lower than normal (*sannatara-* 'lower' or *anudāttatara-* 'lower than *anudātta-*), and (2) the syllable directly following the *udātta-* (provided there was no *udātta-* or *svarita-* in the syllable following that), which began at the high level of *udātta-* and then slowly fell to the level of *anudātta-*. The accent of this syllable was called the "enclitic (or dependent) *svarita-*". A so-called "independent *svarita-*" also existed, but this was always of secondary derivation, having arisen from the contraction of two syllables, the first of which had high pitch and the second low pitch, into a single syllable. The independent *svarita-* was thus a compound intonation comparable to the Greek circumflex. The enclitic *svarita-* differed from the independent *svarita-* in that the former could never appear alone, being totally dependent on a prededing *udātta-* for its existence, while the latter could appear alone as the main accent of a word. Also, the enclitic *svarita-* was a falling intonation, while the independent *svarita-* was a compound, rising-falling intonation.

Phonemically, Sanskrit had level pitches, with the main contrast being between the high pitch of the accented syllable and the low pitch of the other syllables. However, the voice did not rise abruptly from low pitch to high pitch or fall abruptly from high pitch to low pitch, but, rather, both ascent and descent were characterized by clearly audible glides. Thus, the pitch of the accented syllable began at the low level of the positionally-conditioned *sannatara-* and quickly rose to the level of *udātta-*. The pitch was then maintained at a high level until the end of the syllable. Similarly, the pitch of the syllable following the accented syllable began at the high level of *udatta-* and quickly fell to the level of *anudātta-*.

The native grammarians say nothing about stress, and there is nothing to indicates, such as, for example, vowel weakenings or losses, that the language of the Vedas possessed a strong stress accent. There are, however, remnants of an earlier, Indo-European system, manifest in the quantitative vowel gradation, in which stress played an important part. Stress replaced pitch in the spoken language (Classical Sanskrit) only when the latter became extinct in the first centuries CE (cf. Burrow 1973:115; Mayrhofer 1972:29—30).

The Sanskrit accent was free (mobile), that is, not tied to a particular syllable, as, for example, in Czech with its fixed initial accent or Polish with its fixed penultimate accent, but able to fall on any syllable, initial, medial, or final. The position of the accent was morphologically-conditioned, its place in a word having been used as a means to differentiate grammatical relationships. However, the accent was seldom so used alone but, rather, in conjunction with

vowel gradation and/or inflectional endings. Take, for example, the declension of *pad-* 'foot': in the singular, the strong cases are differentiated from the weak cases both by the position of the accent and by changes in the vowel grade of the stem. Furthermore, each case is characterized by a special ending:

Strong Cases		Weak Cases	
Nominative	*pā́t*	Instrumental	*pad-ā́*
Accusative	*pā́d-am*	Dative	*pad-é*
		Genitive-Ablative	*pad-ás*
		Locative	*pad-í*

The following were used enclitically and had no accent of their own, being dependent upon the words with which they were in combination for accent: (1) certain particles such as *iva*, *u*, *ca*, *vā*, etc.; (2) the personal pronouns *mā*, *me*, *nau*, *nas*, *tvā*, *te*, *vām*, and *vas*; (3) the demonstrative pronouns *ena-* and *tva-*; and (4) the indefinite pronoun *sama-*. Loss of accent also occurred in verbs in an independent clause, unless they stood at the beginning of the clause, and in nouns in the vocative case, unless they stood at the beginning of a sentence.

References: Bally 1908; Burrow 1973:113—117; Kuryłowicz 1968:194—197; MacDonell 1916:448—469; Whitney 1889:28—34; Mayrhofer 1972:29—30; Renou 1952:68—76; Hirt 1895:20—24; Thumb 1958—1959.I:207—211.

B. GREEK: Greek, too, had a system of accentuation based on variations in pitch. As in Sanskrit, every word bore an intonation except certain proclitics and enclitics; however, each word normally had only one accented syllable. The accented syllable had either the acute accent (ὀξεῖα), which was one of high pitch (cf. Sanskrit *udātta-*), or the circumflex accent (περισπωμένη, δίτονος, ὀξυβαρεῖα), which was a combination of rising-falling pitch (cf. Sanskrit independent *svarita-*). The circumflex could fall only on long vowels and diphthongs, while the acute could fall on any vowel regardless of quantity. All unaccented syllables had the grave accent (βαρεῖα), which was one of low pitch (cf. Sanskrit *anudātta-*), except for the syllable directly following the accented syllable, which had a falling intonation comparable to the enclitic *svarita-* in Sanskrit. The grammarian Tyrannion (1st century BCE) referred to the accent of this syllable as μέσος 'middle', that is, midway between acute and grave.

Unlike the Sanskrit accent, which could fall on any syllable, the Greek accent was restricted to one of the final three syllables of a word. This restriction was a Greek innovation and was not inherited from Proto-Indo-European. Furthermore, the position of the accent within the final three syllables was regulated by the length of the ultima. These developments affected the distribution of the pitch thus: the acute could fall only one one of the last three syllables of a word if the ultima were short or on one of the last two syllables if the ultima were long, while the circumflex could fall only on

long vowels and diphthongs in the penultimate syllable if the ultima were short or on the ultima itself if it were long. To state things slightly differently, and more accurately, the position of the accent could be no further back from the end of the word than three morae if the ultima contained two morae. However, if the ultima contained only one mora, the position of the accent could be as far back as the the last mora of the antepenult. In the latter case, the number of morae in the penult was irrelevant, either one or two being permissible. This means that the following patterns were possible:

◡́|◡|◡; ◡◡́|◡|◡; ◡́|◡◡|◡; ◡◡́|◡◡|◡; ◡́|◡◡; ◡◡́|◡◡

The grave accent, which was originally considered as the regular intonation of unmarked syllables, was later used in writing as a replacement for the acute on the last syllable of a word when standing before another word in the same sentence.

Since the Greek accent could fall only on one of the final three syllables, an accent originally falling on any other syllable was moved forward to fall on either the antepenult or the penult, depending upon the length of the ultima. However, if an accent originally fell on one of the last three syllables, its position was usually maintained, the exception being the widespread shift of the accent from the ultima to the penult in words ending in a dactyl (–◡◡): ποικίλος < *ποικιλός (cf. Sanskrit *peśalá-ḥ*); ἀγκύλος < *ἀγκυλός (cf. Sanskrit *aṅkurá-ḥ*).

On verbs, regardless of its original position, the accent was thrown back as far toward the front of the word as the rules of accentuation would allow.

Even though the ancient ability of the accent to fall on any syllable was restricted in Greek, the ancient function of accentuation was maintained. As in Sanskrit, the position of the accent within a word was used as a means to indicate grammatical relationships. For example, in the declension of πούς ‘foot’ (cf. Sanskrit *pā́t* ‘foot’), the accent falls on the base in the strong cases but on the ending in the weak cases:

	Singular	Dual	Plural
Nominative	πούς		πόδ-ες
Accusative	πόδ-α		πόδ-ας
Genitive(-Ablative)	ποδ-ός	ποδ-οῖν	ποδ-ῶν
Dative	ποδ-ί		(Homeric) ποσ-σί (Attic) ποσί

Greek possessed a certain number of words that had no accent of their own. These words were used in combination with other words. Some of the unaccented words were inherited from Proto-Indo-European, while others arose in Greek itself. They fall into two categories: (1) the proclitics, which

were combined with a following word, and (2) the enclitics, which were combined with a preceding word. The procitics include: (1) the forms of the definite article ὁ, ἡ, οἱ, αἱ; (2) certain prepositions such as ἐν, ἐκ, πρὸ, ἀνὰ, περὶ, μετὰ, etc.; (3) certain conjunctions; and (4) the negative adverbs οὐ, οὐκ, οὐχ, μὴ. The enclitics include: (1) certain particles such as τε, γε, νυ, etc.; (2) the personal pronouns μου, μοι, σου, σοι, σε, οὑ, οἱ, ἑ, etc.; (3) the indefinite pronoun τις, τι; (4) certain indefinite adverbs; and (5) certain forms of the verb εἰμι 'to be' and φημι 'to say'.

Notwithstanding the limitations mentioned above for Greek and several other minor modifications on one side or the other, the position of the Greek accent corresponds in the main to the position of the Sanskrit accent. Moreover, both agree (1) in having accent systems characterized by contrasts in pitch rather than differences in stress, though stress eventually replaced pitch in both; (2) in the fact that accent played an important role in morphology; and (3) in the fact that accent and meter were independent of each other. These similarities clearly indicate that both the Greek and Sanskrit systems of accentuation must have had a common origin.

References: W. S. Allen 1974:106—124; Bally 1908; Brugmann 1900:150—159; Buck 1933:162—165; M. Bloomfield 1883 and 1888; Collinge 1985:85—87 (Hirt's Law II) and 221—223 (Wheeler's Law); Grammont 1948:387—415; Kuryłowicz 1958:106—161, and 1968:83—110; Lejeune 1972:293—300; Hirt 1895:24—41 and 1902:185—200; Palmer 1980:243—245; Probert 2006; Rix 1992:1—45; Schwyzer 1953.I:371—395; Sihler 1995:235—239; Smyth 1956: 37—42; Sturtevant 1940:94—105; Vendryès 1904; J. Wright 1912:10—18.

C. GERMANIC: From the earliest period of development that can be reconstructed, the Germanic system of word accentuation was characterized by stress, there being no indication that pitch was relevant. Though the tonal character of the Proto-Indo-European accent was lost, the position of the accent, as established by the correspondence of Sanskrit and Greek, was originally preserved in Proto-Germanic. This is confirmed by Verner's Law (cf. Collinge 1985:203—216), according to which the position of the accent influenced the development of the voiceless stops. First, the voiceless aspirates (traditional plain voiceless stops) became voiceless fricatives: *p^h, *t^h, *k^h, *k^{wh} > *f, *θ, *χ, *χw, except after *s-. Then, medial (and final) *f, *θ, *χ, *χw, together with *s, became *β, *$\eth$, *γ, *γw, and *z, respectively, except (1) before *s or *t and (2) between vowels when the accent fell on the contiguous preceding syllable. Thus, if the accent followed or fell on a noncontiguous preceding syllable, the fricatives became voiced. The following examples illustrate these developments:

Proto-Indo-European *p^h > Proto-Germanic *f:

A. Sanskrit *páñca* 'five'; Greek (Attic) πέντε, (Aeolian) πέμπε 'five'; Latin *quīnque* 'five'; Lithuanian *penkì* 'five' < Proto-Indo-European

*$p^hénk^wh_e$ ‘five’ > Proto-Germanic (**fémfe* >) **fimfi* ‘five’ > Gothic *fimf* ‘five’; Old Icelandic *fimm* ‘five’; Faroese *fimm* ‘five’; Swedish *fem* ‘five’; Norwegian *fem* ‘five’; Danish *fem* ‘five’; Old English *fīf* ‘five’; Old Frisian *fīf* ‘five’; Old Saxon *fīf* ‘five’; Dutch *vijf* ‘five’; Old High German *fimf*, *finf*, *funf* ‘five’ (New High German *fünf*). Cf. Orël 2003:98 **fenfe*; Kroonen 2013:140; Feist 1939:154; Lehmann 1986: 117; De Vries 1977:120; Falk—Torp 1903—1906.I:153 **fimf* (< **pempe*); Onions 1966:358 **fimfi* (< **pempe* < **peŋqwe*); Klein 1971: 283; Boutkan—Siebinga 2005:113 **finfe*; Kluge—Mitzka 1967:224 **fëmf(e)*; Kluge—Seebold 1989:236 **femf(e)*; Vercoulie 1898:307.

B. Sanskrit *nápāt* ‘grandson, descendant’; Avestan *napāt-* ‘grandson’; Old Persian *napāt-* ‘grandson’; Latin *nepōs*, *-tis* ‘grandson’ < Proto-Indo-European **nép^h-ōt^h-* ‘grandson, nephew’ > Proto-Germanic **néfōð* ‘nephew’ > Old Icelandic *nefi* ‘nephew’; Old English *nefa* ‘nephew, grandson, stepson’; Old Frisian *neva* ‘nephew’; Old Saxon *neƀo* ‘nephew’; Middle Dutch *neve* ‘nephew’ (Dutch *neef*); Old High German *nevo* ‘nephew’ (New High German *Neffe*). Cf. Orël 2003:283 **nęfōđ(z)*; Kroonen 2013:386; De Vries 1977:406; Kluge—Mitzka 1967:506; Kluge—Seebold 1989:500—501; Vercoulie 1898:200.

Proto-Indo-European *t^h > Proto-Germanic *θ:

A. Sanskrit *tráyaḥ* ‘three’; Greek τρεῖς ‘three’; Latin *trēs* ‘three’; Old Church Slavic *trьje* ‘three’; Lithuanian *trỹs* ‘three’ < Proto-Indo-European *t^hréyes* ‘three’ > Proto-Germanic (**θréyez* >) **θríyiz* ‘three’ > Gothic *þreis* ‘three’; Old Icelandic (m.) *þrír*, (f.) *þrjár*, (n.) *þrjú* ‘three’; Faroese *tríggir* ‘three’; Norwegian *tri* ‘three’; Swedish *tre* ‘three’; Danish *tre* ‘three’; Old Engish (m.) *þrī(e)*, (f./n.) *þrēo* ‘three’; Old Frisian (m.) *thrē*, (f.) *thriā*, (n.) *thriū* ‘three’; Old Saxon (m.) *thria*, *thrie*, (f.) *threa*, (n.) *thriu*, *thrū* ‘three’; Dutch *drie* ‘three’; Old High German (m.) *drī*, (f.) *drīo*, (n.) *driu* ‘three’ (New High German *drei*). Orël 2003:425 **þrejez*; Kroonen 2013:546—547; Lehmann 1986:365—366; Feist 1939:502; De Vries 1977:622; Falk—Torp 1903—1906.II:377; Boutkan—Siebinga 2005:403; Onions 1966:919 **þrijiz*; Klein 1971:763; Kluge—Mitzka 1967:141—142 **þrijiz*; Kluge—Seebold 1989:154 **þrej(ez)*; Vercoulie 1898:63.

B. Sanskrit *bhrā́tar-* ‘brother’; Greek (Doric) φρᾱ́τερ- ‘a member of a brotherhood, fraternity, clan’; Latin *frāter* ‘brother’; Old Irish *bráthir* ‘brother’ < Proto-Indo-European **b^{h}rā́t^{h}er-* ‘brother’ (< **b^{h}réA-t^{h}er-* [**b^{h}ráA-t^{h}er-*]) > Proto-Germanic **brṓθēr* ‘brother’ > Gothic *brōþar* ‘brother’; Old English *brōþor* ‘brother’; Old Frisian *brōther* ‘brother’; Old Saxon *brōther* ‘brother’; Old Dutch *bruother* ‘brother’. Orël 2003:57—58 **ƀrōþēr*; Kroonen 2013:79; Lehmann 1986:81; Feist 1939:106—107; Boutkan—Siebinga 2005:64 **brōþēr*; Onions 1966: 121 **brōþar*; Klein 1971:97.

Proto-Indo-European *k^h > Proto-Germanic *χ:

A. Sanskrit *śatám* ‘hundred’; Avestan *satəm* ‘hundred’; Greek ἑκατόν ‘hundred’; Latin *centum* ‘hundred’; Old Irish *cét* ‘hundred’; Tocharian A *känt*, B *kante* ‘hundred’; Lithuanian *šim̃tas* ‘hundred’; Old Church Slavic *sъto* ‘hundred’ < Proto-Indo-European *$k^h\eta t^h$*ó-m* ‘hundred’ > Proto-Germanic *χ*unðán* ‘hundred’ (compound *χ*unða-raða-*) > Gothic *hunda* ‘hundred’; Old Icelandic *hundrað* ‘hundred’; Faroese *hundrað* ‘hundred’; Swedish *hundra* ‘hundred’; Norwegian *hundrad* ‘hundred’; Danish *hundred* ‘hundred’; Old English *hund*, *hundred* ‘hundred’; Old Frisian *hund*, *hundred* ‘hundred’; Old Saxon *hund*, *hunderod* ‘hundred’; Dutch *honderd* ‘hundred’; Old High German *hunt*, *hundert* ‘hundred’ (New High German *hundert*). Orël 2003:193 **xunđan*, 193 **xunđa-rađan*; Kroonen 2013:256; Feist 1939:375—376; Lehmann 1986:194—195; De Vries 1977:267; Falk—Torp 1903—1906.I:308; Onions 1966:452—453 *χ*undam*; Klein 1971:356; Boutkan—Siebinga 2005:184—185 **hunda-raþa-*; Kluge—Mitzka 1967:321; Kluge—Seebold 1989:320 **hunda-*; Vercoulie 1898:114.

B. Sanskrit *páśu* ‘cattle’; Avestan *pasu-* ‘cattle’; Latin *pecū*, *pecus* ‘flock, herd’; Lithuanian *pẽkus* ‘cattle’ < Proto-Indo-European *p^hék^hu-* ‘cattle’ > Proto-Germanic **feχu* ‘cattle, goods’ > Gothic *faihu* ‘cattle, property, money’; Old Icelandic *fé* ‘cattle; sheep’; Faroese *fæ* ‘cattle’; Swedish *fä* ‘beast, brute’; Norwegian *fe* ‘cattle, goods’; Danish *fæ* ‘beast, brute, cattle’; Old English *feoh* ‘cattle; money’; Old Frisian *fiā* ‘movables, personal property’; Old Saxon *fehu*, *feho* ‘cattle; money’; Middle Dutch *ve(e)*, *veeh*, *vie(h)*, *veede* ‘cattle’ (Dutch *vee*); Old High German *fihu*, *fiho* ‘cattle, livestock’ (New High German *Vieh*). Orël 2003:97 **fexu*; Kroonen 2013:134; De Vries 1977:114; Falk—Torp 1903—1906.I:206; Feist 1939:135—136; Lehmann 1986:102—103; Onions 1966:349; Klein 1971:276; Skeat 1898:205; Boutkan—Siebinga 2005:110 **fehu*; Vercoulie 1898:301—302; Kluge—Mitzka 1967:820—821; Kluge—Seebold 1989:765.

Proto-Indo-European *k^{wh} > Proto-Germanic *χw:

A. Sanskrit *ká-ḥ* ‘who?’; Latin *quī* ‘in what manner?, how?’; Lithuanian *kàs* ‘who?’ < Proto-Indo-European *k^{wh}o-* ‘who?’ > Proto-Germanic *χwa-* ‘who?’ > Gothic *hvas* ‘who?’; Old Icelandic *hverr* ‘who?, which?, what?’; Faroese *hvør* ‘who?’; Danish *hvo*, *hvem* ‘who?’; Swedish *vem* ‘who?’; Norwegian (Bokmål) *hvem* ‘who?’, (Nynorsk) *kven* ‘who?’; Old English *hwā* ‘who?’; Old Frisian *hwā* ‘who?’; Old Saxon *hwē*, *hwie* ‘who?’; Dutch *wie* ‘who?’; Old High German *(h)wer* ‘who?’ (New High German *wer*). Kroonen 2013:261; Orël 2003:199 **xwaz* ~ **xwez*; Feist 1939:282 **hwa-*; Lehmann 1986:198; De Vries 1977:272; Falk—Torp 1903—1906.I:314; Onions 1966:1004; Klein

1971:827 **hwa-*, **hwe-*; Cummins 1881:42; Vercoulie 1898:325; Kluge—Mitzka 1967:853; Kluge—Seebold 1989:787.

B. Greek λείπω ‘to leave’; Old Irish *léicid* ‘to let loose, to let fly, to let go, to dismiss’; Armenian *lk^{h}anem* ‘to leave, to let go, to release, to abandon’; Lithuanian *liekù* ‘to stay, to remain, to be left over’ < Proto-Indo-European **léyk^{wh}ō* (< **léyk^{wh}oH*) ‘to leave’ > Proto-Germanic (inf.) **lī́χwan* ‘to lend’ > Gothic *leihvan* ‘to lend’; Old Icelandic *ljá* ‘to lend something to someone’; Old Swedish *lea* ‘to lend’; Old English *on-leōn* ‘to lend, to grant’; Old Frisian *liā* ‘to lend’; Old Saxon *līhan* ‘to lend’; Old High German *līhan* ‘to lend’ (New High German *leihen*). Orël 2003:247 **līxwanan*; Kroonen 2013:336; Lehmann 1986:230; Feist 1939:327; De Vries 1977:359 **līhwan*; Kluge—Mitzka 1967:434; Kluge—Seebold 1989:437.

Proto-Indo-European **p^{h}* > Proto-Germanic **β*:

Sanskrit *saptá* ‘seven’; Greek ἑπτά ‘seven’; Latin *septem* ‘seven’ < Proto-Indo-Eurpean **sep^{h}t^{h}m̥̄* ‘seven’ > Pre-Germanic **sep^{h}m̥̄* ‘seven’ > Proto-Germanic **seβún* ‘seven’ > Gothic *sibun* ‘seven’; Old Icelandic *sjau* (< **sjöβu*) ‘seven’; Faroese *sjey* ‘seven’; Norwegian *sjau* ‘seven’; Danish *syv* ‘seven’; Swedish *sju* ‘seven’; Old English *seofon* (< **seβun*) ‘seven’; Old Frisian *soven*, *sigun* (the *g* is from *ni(u)gun* ‘nine’), *siugun*, *sogen*, *sav(e)n* ‘seven’; Old Saxon *siƀun* ‘seven’; Dutch *zeven* ‘seven’; Old High German *sibun* ‘seven’ (New High German *sieben*). Kroonen 2013:429; Orël 2003:321 **seƀun*; Feist 1939:417; Lehmann 1986:300—301; Falk—Torp 1903—1906.II:340—341; De Vries 1977:478; Onions 1966:813 **seƀun*; Klein 1971:676; Boutkan—Siebinga 2005:339 **sebun*; Kluge—Mitzka 1967:706—707 **seƀun*; Kluge—Seebold 1989:671 **sebun*; Vercoulie 1898:336.

Proto-Indo-European **t^{h}* > Proto-Germanic **ð*:

Sanskrit *pitár-* ‘father’; Greek πατέρ- ‘father’; Latin *pater* ‘father’ < Proto-Indo-European **p^{h}Ḫt^{h}ér-* ‘father’ > Proto-Germanic *faðér-* ‘father’ > Gothic *fadar* ‘father’; Old Icelandic *faðir* ‘father’; Faroese *faðir* ‘father’; Swedish *fader* ‘father’; Danish *fader* ‘father’; Norwegian *fader* ‘father’; Old English *fæder* ‘father’; Old Frisian *feder*, *fader* ‘father’; Old Saxon *fadar* ‘father’; Dutch *vader* ‘father’; Old High German *fater* ‘father’ (New High German *Vater*). Orël 2003:88 **faðēr*; Kroonen 2013:121; Feist 1939:133; Lehmann 1986:101; De Vries 1977:109; Falk—Torp 1903—1906.I:144 **fadêr*; Onions 1966:347 **fadēr*; Klein 1971:275; Boutkan—Siebinga 2005:102 **fadēr*; Kluge—Mitzka 1967:810 **fadēr* (< **pətér*); Kluge—Seebold 1989:756 **fader* (< **pətḗr*); Vercoulie 1989:300.

Proto-Indo-European **k^{h}* > Proto-Germanic **γ*:

Sanskrit *śvaśrū́-* 'mother-in-law' < Proto-Indo-European **swekʰrū́-* (< **swekʰrúH-*) 'mother-in-law' > Proto-Germanic **sweɣrū́-* 'mother-in-law' > Old English *sweger* 'mother-in-law'; Middle Dutch *sweger* 'mother-in-law'; Old High German *swigar* 'mother-in-law' (New High German *Schwieger*). Orël 2003:393 **sweɣrō*; Kroonen 2013:498; Kluge—Mitzka 1967:693; Kluge—Seebold 1989:661 **swegrō*. Cf. also Feist 1939:462; Lehmann 1986:332; De Vries 1977:571.

Proto-Indo-European **kʷʰ* > Proto-Germanic **ɣw*:

Proto-Indo-European **sekʷʰ-ní-s* 'sight' > Proto-Germanic **seɣw-ní-s* 'sight' > Gothic *siuns* 'form, face, countenance'; Old Icelandic *sjón* 'sight, eyesight', *sýn* 'sight'; Faroese *sjón* 'sight'; Norwegian *sjon* 'sight'; Old Danish *siun* 'sight'; Old English *on-sēon* 'to see', *sīn*, *sȳn* 'sight, vision', *sīen* 'power of seeing, sight, vision; pupil, eye'; Old Saxon *siun* 'sight'; Old Frisian *siōne*, *siūne* 'sight'. Kroonen 2013:434—435 **seuni-*; Orël 2003:322 **seɣwniz*; De Vries 1977:479 **segu̯-ni-* and 573; Feist 1939:426 **seɣw-ni-*; Lehmann 1986:307 **segw-ni-*; Boutkan—Siebinga 2005:343.

Proto-Indo-European **s* > Proto-Germanic **z*:

Sanskrit *snuṣā́* 'daughter-in-law' < Proto-Indo-European **snusā́* (< **snusáA*) 'daughter-in-law' > Proto-Germanic **snuzṓ* 'daughter-in-law' > Old Icelandic *snor*, *snör* 'daugher-in-law'; Old English *snoru* 'daughter-in-law'; Old Frisian *snore* 'daughter-in-law'; Middle Low German *snoere*, *snorre* 'daughter-in-law'; Old High German *snura* 'daughter-in-law' (New High German *Schnur*). Orël 2003:359 **snuzō(n)*; Kroonen 2013:463; De Vries 1977:528; Kluge—Mitzka 1967:673; Kluge—Seebold 1989:649.

After the sound changes described by Verner's Law had taken place, many Germanic nouns and verbs were characterized by a paradigmatic alternation between forms with voiceless fricatives and forms with voiced fricatives. Even though there was a tendency in the Germanic daughter languages to level out the paradigm, numerous traces of the former alternation remain, especially in the verbs. Take, for example, the verb **wérθan* 'to become' (cf. Prokosch 1939:65; Hirt 1931—1934.I:76; Krause 1968:127):

Proto-Germanic	**wérθō*	**wárθa*	**wurðumí*	**wurðaná-z*
Gothic	*wairþa*	*warþ*	*waurþum*	*waurþans*
Old Icelandic	*verða*	*varð*	*urðom*	*orðenn*
Old English	*weorþe*	*wearþ*	*wurdon*	*worden*
Old Frisian	*werthe*	*warth*	*wurdon*	*worden*
Old Saxon	*wirthu*	*warth*	*wurdun*	*gi-wordan*
Old High German	*wirdu*	*ward*	*wurtum*	*gi-wortan*
New High German	*werde*	*ward* (*wurde*)	*wurden*	*ge-worden*

Compare the Sanskrit verb *vṛt-* ‘to turn’:

vártāmi *va-várta* *va-vṛtimá* *vṛtaná-ḥ*

Toward the end of the Proto-Germanic period, the old mobile accent was lost, and the stress became fixed on the initial syllable. This new fixed initial stress characterized (1) simple nominal forms, (2) simple verbal forms, and (3) compound nominal forms. Compound verbal forms were accented differently, however. In compound verbal forms, the stress fell on the first syllable of the second member. The verbal compounds, apparently later formations than the nominal compounds, were not strongly joined together, and, therefore, the accent was not shifted to the preverb. The independent nature of the two members of the verbal compounds was still preserved in Gothic, where the enclitic copula *-uh-* ‘and’ could be placed between the preverb and the verb. If a nominal compound were composed of two substantives, the initial syllable of the first member had primary stress, and the initial syllable of the following member had secondary stress. The foregoing system of accentuation still prevails in the modern West Germanic languages.

Both Swedish and Norwegian make considerable use of pitch. However, the use of pitch in these two languages has arisen in historical times and does not go back to either Proto-Indo-European or Proto-Germanic.

References: W. H. Bennett 1972; Collinge 1985:63—76 (Grimm’s Law) and 203—216 (Verner’s Law); Fortson 2010:339—342; Harbert 2007:79—84; Hirt 1931—1934.I:89—91 (Verner’s Law) and 143—161; Kuryłowicz 1968:191—194; Meillet 1970:24—29 and 37—42; Prokosch 1939:60—68, §20 (Verner’s Law); Ringe 2006:93—105; Fulk 2018:35—42 and 107—110 (Verner’s Law); Streitberg 1963:163—191.

D. SLAVIC: No theory has yet been proposed that can account completely for all of the data relative to the development of accentuation in the Slavic languages. This is due in part to the fact that all knowledge concerning accentuation is drawn solely from the modern languages, that is to say, from about the fourteenth century on, and in part to the fact that the older patterns have been greatly disrupted by subsequent changes. The following discussion closely follows that of Shevelov (1964:38—80).

That Proto-Indo-European had a system of accentuation characterized by contrasts in pitch is confirmed by the evidence of Sanskrit and Greek. Stress was nondistinctive, each syllable being pronounced with more or less equal intensity. The Indo-European dialect from which Proto-Slavic (and Proto-Baltic) descended preserved the tonal character of the accent. However, the position of the accent underwent a systematic displacement.

In the Disintegrating Indo-European dialect that gave rise to Balto-Slavic, the rising pitch was shifted to long monophthongs and long diphthongs. The shift of rising pitch to these positions left falling pitch on all other syllables (cf.

Shevelov 1964:70, §4.14A). No doubt, the loss of laryngeals was the cause of both the accent shift and compensatory vowel lengthening. Eventually, long monophthongs and diphthongs of whatever origin (except when due to contractions) received rising pitch under the influence of the intonation of long monophthongs and diphthongs resulting from the loss of laryngeals. The intonations were not phonemic at this time, depending solely on vowel quantity for their distribution.

The earliest form of Proto-Slavic was probably characterized by a weak fixed penultimate stress (cf. Shevelov 1964:70—71, §4.14B). In addition, Proto-Slavic had rising pitch and falling pitch, but these intonations were not phonemic; rising pitch characterized long monophthongs and long diphthongs, and falling pitch characterized short diphthongs and contractions. Short monophtongs were apparently tonally nondistinctive (cf. Bidwell 1963:9; Shevelov 1964:45—46, §4.6). However, Stang (1965:173) maintains that, while short monophtongs were originally tonally nondistinctive, they later had falling pitch in initial syllables and rising pitch elsewhere. The intonation became phonemic when, at a later date, the long diphthongs underwent shortening and merged with the short diphthongs. Even though the former long diphthongs had been shortened, they retained rising pitch. Thus, the original short diphthongs had falling pitch, while short diphthongs from original long diphthongs had rising pitch.

After the shortening of long diphthongs had taken place, stress was shifted from a penultimate syllable with falling pitch or short monophthong to a contiguous preceding syllable with rising pitch (cf. Shevelov 1974:71—75, §4.14C; Vaillant 1950.I:246—252, §99). Stress was not shifted in those words that had either rising pitch or falling pitch only on every syllable.

Thus, the Proto-Slavic system of accentuation was dominated by pitch. Even though each syllable had its characteristic pitch, however, it was only under stress that pitch became distinctive. The stress usually fell on the penultimate syllable but was shifted to a contiguous preceding syllable with rising pitch or to a following syllable with rising pitch when the penult contained either falling pitch or a short monophthong. A stressed penult could have either rising pitch or falling pitch depending upon the original quantity of the vowel segment.

When Proto-Slavic began to split up into dialects, the system of accentuation outlined above as destroyed. Two events caused the disruption of the old accent system: First, there was a widespread shortening of long vowels. Next, there was a series of stress shifts. In the South Slavic dialects, the stress shifts were accompanied by shifts in vowel quantity and pitch. It was in the South Slavic area that the so-called “new rising pitch” and “new falling pitch” arose (cf. Shevelov 1964:563—569, §§33.14—33.15). The other Slavic dialects, some of which also underwent shifts in quantity, give no evidence of any pitch mutations. Indeed, phonemic pitch was probably lost in the East and West Slavic languages at the time of the stress shifts (cf. Shevelov 1964:563—569, §33.14, and 574—578, §33.17).

The various Slavic daughter languages underwent further phonological and morphological developments that affected accentuation. Therefore, none of the modern languages preserve the earlier system of accentuation. Only Serbo-Croatian and Slovene still have phonemic pitch. As far as the other daughter languages go, the former distribution of pitch is indicated in Czech by the opposition of long vowels and short vowels, in Bulgarian by the position of the stress, and in East Slavic by the accentuation of the groups *oro*, *ere*, *olo*, *ele*.

References: Bethin 1998; Collinge 1985:29—30 (Dolobko's Law), 31—33 (Dybo's Law), 30—36 (Ebeling's Law), 41—46 (Fortunatov's Law I), 77—79 (Hartmann's Law), 81—83 (Hirt's Law I), 89—91 (Hjelmslev's Law), 103—104 (Illič-Svityč's Law), 147—148 (Pedersen's Law II), 149—152 (Saussure's Law), 179 (Stang's Law), 197—198 (Van Wijk's Law), 225—227 (Winter's Law), 271—277 (Appendix III: Laws of Accentuation in Balto-Slavic); Collins 2018:1500—1514; Derksen 2004; Garde 1976; Halle 1997; Halle—Kiparsky 1977 and 1981; Illič-Svityč 1979; Jasanoff 2017a; Kuryłowicz 1956:162—356 and 1968:111—190; Olander 2009; Shevelov 1964; Stang 1965; Sukač 2013; Vaillant 1950.I:221—283.

E. CELTIC: The accentuation of Old Irish was remarkably similar to that of Late Proto-Germanic. Old Irish had a stress accent that normally fell on the first syllable of a word, the main exception being, as in Germanic, in compound verbal forms, where the stress fell on the first syllable of the second member except in the imperative. The stress caused the weakening and loss of unaccented vowels.

In all of the modern Brythonic languages, with the exception of the Vannetais dialect of Breton, the stress falls on the penult. In Vannetais, the stress falls on the ultima. Old Welsh was accented on the ultima, and it is probable that this was the original position of the accent in all of the Brythonic languages.

References: Lewis—Pedersen 1937:68—80; Pedersen 1909—1913.I:255—291; Thurneysen 1884 and 1946:27—31; Morris Jones 1913:47—65.

F. ITALIC: In Early Latin, as well as in Oscan and Umbrian, the accent fell on the first syllable of a word. That the accent was one of stress is shown by the effect it had on unaccented vowels. The vowel of the initial syllable was never modified, but the vowels of the unaccented syllables were regularly weakened or lost. The syllable directly following the initial syllable underwent the greatest modification, often being completely lost: for example, Latin *aetās* 'age' < **avitās*.

Between Early Latin and Classical Latin, the position of the accent was shifted. In Classical Latin, the accent fell on the penult if this were long or on the antepenult if the penult were short. Words with four or more syllables had a

secondary accent on the first syllable: for example, (acc. sg.) *tèmpestā́tem* ‘a space or period of time; weather’.

References: W. S. Allen 1978:83—88; Buck 1933:165—167; Collitz 1897; De Vaan 2008:9—10; Lindsay 1894:148—218; L. Palmer 1954:211—214; Sihler 1995:239—242; Sturtevant 1911, 1921, and 1940:183—189; Westaway 1913.

G. ARMENIAN: In Classical Armenian, the accent fell on what had originally been the penultimate syllable. That the accent was one of stress is shown by the widespread reduction and elimination of unaccented syllables.

References: Godel 1975:12 and 72; Meillet 1936:19—23.

H. SUMMARY: The Old Indic system of accentuation remained the most faithful to that of Disintegrating Indo-European. The accent limitation rule found in Greek is clearly an innovation. Likewise, the development of the circumflex probably arose, at least in part, as the result of contractions in the early prehistory of Greek itself (cf. Kuryłowicz 1958:106—113 and 1968:83—90). Baltic and Slavic have innovated even more than Greek. Unlike Disintegrating Indo-European and Old Indic, which had register-type systems, Baltic and Slavic had contour-type systems. Moreover, the position of the accent has undergone a systematic displacement. The accentuation of Disintegrating Indo-European and Old Indic was syllable oriented, while that of Greek, Baltic, and Slavic was mora oriented. None of the remaining daughter languages supply any information either about the distribution or about the quality of the accent in the parent language except for Germanic, which supplies some information about the original position of the accent.

References: Adrados—Bernabé—Mendoza 1995—1998.I:393—402; Beekes 1995:148—154 and 2011:153—159; Brugmann 1904:52—66; Fortson 2004: 62 and 2010:68; Halle—Kiparsky 1977; Hirt 1895; Kuryłowicz 1956 and 1968; Lubotsky 1988; Meier-Brügger 2003:152—158; Meillet 1964:140—143; Szemerényi 1996:73—82.

5.15. METER

Comparison of Sanskrit and Greek indicates that poetic meter in Disintegrating Indo-European was quantitative, being based upon the regular repetition of long and short syllables. Though the original patterning has sometimes been obscured, the rule is clear that open syllables ending in a short vowel were metrically short, while open syllables ending in a long vowel and closed syllables were metrically long.

References: W. S. Allen 1973; Devine—Stephens 1994; Fitzhugh 1912; Jasanoff 2004b; Lehmann 1952:19—20, §2.4; Masqueray 1899; Meillet 1923 and 1964: 143—144; Sievers 1893; Watkins 1995; West 1973, 1987, and 2007.

CHAPTER SIX

A SKETCH OF PROTO-KARTVELIAN PHONOLOGY

6.1. STOPS, AFFRICATES, AND FRICATIVES

Proto-Kartvelian had a rich system of stops, affricates, and fricatives. Each stop and affricate series was characterized by the three-way contrast (1) voiceless (aspirated), (2) voiced, and (3) glottalized. Thomas V. Gamkrelidze and Givi Mačavariani (1982:18) reconstruct three separate series of affricates and fricatives, namely, a front series (**c*, **ç*, **ʒ*, **s*, **z*), a mid series (**c₁*, **ç₁*, **ʒ₁*, **s₁*, **z₁*), and a back series (**č*, **č̣*, **ǯ*, **š*, **ž*) on the basis of the following correspondences:

Proto-Kartvelian		Georgian		Zan and Svan
*c, *c', *ʒ, *s, *z	=	c, c', ʒ, s, z	=	c, c', ʒ, s, z
*c$_1$, *c'$_1$, *ʒ$_1$, *s$_1$, *z$_1$	=	c, c', ʒ, s, z	=	č, č', ǯ, š, ž
*č, *č', *ǯ, *š, *ž	=	č, č', ǯ, š, ž	=	čk, č'k', ǯg, šk, žg

Both Klimov (1964 and 1998) and Fähnrich—Sardshweladse (1995) follow Gamkrelidze and Mačavariani. However, Karl Horst Schmidt (1962:54—67) reconstructs only two series — Schmidt considers the reflexes found in Zan (Mingrelian and Laz) and Svan to represent the original patterning, and those found in Georgian to be an innovation. It is the views of Schmidt that are followed in this book (Georg 2002 also supports Schmidt's views). Thus, according to Schmidt, the following affricates and sibilants are to be reconstructed for Proto-Kartvelian:

I Dental Affricates	II Palato-alveolar Affricates	III Clusters
*c, *c', *ʒ, *s, *z	*č, *č', *ǯ, *š, *ž	*čk, *č'k', *ǯg, *šk, *žg

Comparison with other Nostratic languages indicates that series III developed from earlier palatalized alveolar stops and sibilants: **t^y*, **t'^{y}*, **d^y*, **s^y*, (**z^y*) respectively. In pre-Proto-Kartvelian, the palatalized alveolars were first reanalyzed as geminates: **ćć*, **ć'ć'*, **ǯǯ*, **śś*, (**źź*). Subsequently, the geminates dissimilated into **ćt^y*, **ć't'^{y}*, **ǯd^y*, **śt^y*, (**źd^y*), which then became **čt^y*, **č't'^{y}*, **ǯd^y*, **št^y*, (**žd^y*). These developments are similar to what happened to Proto-Slavic **t^y* and **d^y* in Bulgarian and Old Church Slavic and to **d^y* in certain Greek dialects, within Indo-European. The final change in Proto-Kartvelian was the further dissimilation into the clusters **čk*, **č'k'*, **ǯg*, **šk*, (**žg*) respectively. These clusters were preserved in Svan and Zan but were simplified into palato-alveolar affricates in Georgian (no

doubt after the original palato-alveolar affricates had been lost — they appear as dental affricates in Georgian). For Georgian phonology, cf. Aronson 1997.

The Proto-Kartvelian phonological system may be reconstructed as follows (cf. Fähnrich—Sardshweladse 1995:25; Fähnrich 2007:26; Gamkrelidze—Mačavariani 1982:25—61; Gamkrelidze 1967:709; Schmidt 1962:60):

Obstruents:	p	t	c	č	k	q	
	b	d	ʒ	ǯ	g	ɢ	
	p’	t’	c’	č’	k’	q’	
			s	š	x		h
			z	(ž)	γ		
Resonants:	m/m̥	n/n̥	l/l̥	r/r̥	y/i	w/u	
Vowels:		e, ē	o, ō	a, ā			

Notes:
1. The voiceless stops and affricates were aspirated (*p^h, *t^h, *c^h, *$č^h$, *k^h, *q^h). The aspiration was phonemically non-distinctive.
2. Fähnrich (2007:15) reconstructs several additional phonemes for Proto-Kartvelian. These new phonemes are highly controversial and, therefore, are not included here.

The reconstruction of a voiced postvelar *ɢ in Proto-Kartvelian is controversial. In Georgian, the glottalized postvelar was preserved, while the voiceless (aspirated) and voiced postvelars merged with *x* and *γ* respectively:

Proto-Kartvelian		Georgian
*q	>	x
*ɢ	>	γ
*q’	>	q’

A notable feature of Kartvelian phonology is the existence of complex consonant clusters (cf. Aronson 1997:935—938) — Georgian, for example, tolerates 740 initial clusters, which can have upwards of six members (Fähnrich 1993:20 lists eight — his example is *gvprckvnis* ‘er läßt uns [finanziell] zur Ader’ / ‘he is bleeding us dry [financially]; he is sucking the blood out of us [financially]’), and 244 final clusters (cf. Hewitt 1995:19—20). In Svan, on the other hand, initial consonant clusters are far less complex than in Georgian, while final clusters can be far more complex (cf. Tuite 1997:7—8).

Unlike Georgian, Svan does not distinguish /v/ and /w/ as distinct phonemes — it only has /w/.

6.2. RESONANTS

The Proto-Kartvelian resonants could function as syllabics or non-syllabics depending upon their environment. The patterning is strikingly similar to what is assumed to have existed in Proto-Indo-European. According to Gamkrelidze (1966:71—73 and 1967:709—711), the distributional patterning was as follows: The resonants were syllabic (A) after a consonant and before a pause, *$C\underset{\circ}{R}$#; (B) in stem-final position after a consonant, *-$C\underset{\circ}{R}$; (C) between consonants, *$C\underset{\circ}{R}C$; and (D) after pause and before a consonant, *#$\underset{\circ}{R}C$. They were non-syllabic (A) after pause and before a vowel, *#*RV*; (B) after a vowel and before pause, **VR*#; (C) between a vowel and a consonant, **VRC*; and (D) between vowels, **VRV*. However, when found between a consonant and a vowel, **CRV*, there appears to have been free variation, at the Proto-Kartvelian level, between the syllabic and non-syllabic allophones, *$C\underset{\circ}{R}V$ ~ **CRV* — Mingrelian, Laz, and Svan point to earlier syllabic resonants, while Georgian points to earlier non-syllabic resonants. Finally, when two resonants were in contact, one was syllabic and the other non-syllabic — the choice of one or the other allophone appears to have been completely flexible, so that **RRV*, for example, could be realized as either *$\underset{\circ}{R}RV$; or *$R\underset{\circ}{R}V$. Due to various sound changes, the resonants no longer function as a separate class in any of the Kartvelian daughter languages.

6.3. VOWELS

Three short vowels and three long vowels are usually reconstructed for Proto-Kartvelian: **e*, **ē*; **o*, **ō*; **a*, **ā*. These vowels were not evenly distributed — the vowel **o* in particular was of a fairly low statistical frequency of occurrence in comparison with **e* and **a*. As in Proto-Indo-European, the vowels underwent various ablaut changes. These vowel alternations served to indicate different types of grammatical formations. The most common alternation was the interchange between the vowels **e* and **a* in a given syllable. There was also an alternation among lengthened-grade vowels, normal-grade vowels, and reduced- and/or zero-grade vowels. Reduced-grade was functionally a variant of zero-grade, while lengthened-grade was functionally a variant of normal-grade. The lengthened-grade, which was found mostly in the system of primary verbs and was a fundamental morphological component of a group of verbal stems with thematic aorist (cf. Gamkrelidze 1967:712), appears to have been a late creation (cf. Gamkrelidze 1966:82). The basic rule was that no more than one morpheme could have a full-grade vowel in a given polymorphic form, the other morphemes in the syntagmatic sequence being in either zero-grade or reduced-grade.

The vowel system of Pre-Proto-Kartvelian may have been as follows:

Vowels:	i (~ e)	u (~ o)
	e	o
	(ə ~) a	

Also the sequences:	iy (~ ey)	uy (~ oy)	ey	oy	(əy ~) ay
	iw (~ ew)	uw (~ ow)	ew	ow	(əw ~) aw

This is identical to the vowel system reconstructed for the earliest form of Proto-Indo-European. As with Proto-Indo-European, I assume that the qualitative ablaut alternations are very old and that they preceded the quantitative alternations.

Proto-Kartvelian proper began with the phonemicization of a strong stress accent (cf. Gamkrelidze 1966:81, §3.4; Gamkrelidze—Mačavariani 1982:95—96; Schmidt 1962:41). This accent caused the weakening and/or loss of the vowels of unaccented syllables. There was a contrast between those syllables with stress and those syllables without stress. As in Proto-Indo-European, stress positioning appears to have functioned as a means of indicating different grammatical relationships. The phonemicization of a strong stress accent in early Proto-Kartvelian caused a restructuring of the inherited vowel system and brought about the development of syllabic nasals and liquids and may also have ultimately been responsible for the creation of the so-called "introvertive (decessive) harmonic consonant clusters".

When stressed, **ə* became **e*, while, when unstressed, it became **i*. The vowels **o* and **a* remained unchanged when stressed, but became **Ø* when unstressed (cf. Gamkrelidze—Mačavariani 1982:96).

Though Proto-Indo-European and Proto-Kartvelian may be assumed to have undergone similar developments in their early prehistory, the resulting systems were not identical (cf. Harris 1990:90—92). For example, Proto-Kartvelian did not rephonemicize apophonic **a* as **o* as did Proto-Indo-European, while, in the reduced-grade, **e* was realized as **i* in Proto-Kartvelian and not as **ə* (traditional "schwa secundum", usually written **ь*), which appears to have been the regular development in Proto-Indo-European. Moreover, though a rule similar to that found in Proto-Kartvelian prohibiting more than one full-grade vowel in any given polymorphemic form must have also characterized an early stage of Proto-Indo-European, in its later stages of development, this rule was no longer operative.

The sound systems of the Kartvelian daughter languages are relatively similar, with only the vowel systems exhibiting major differences. In addition to the vowels *a*, *e*, *i*, *o*, *u*, which exist in all of the daughter languages, the various Svan dialects have *ä*, *ö*, *ü*, and *ə*. Each of these vowels also has a lengthened counterpart, thus giving a total of eighteen distinctive vowels in some dialects of Svan. Vowel length is not distinctive in the other Kartvelian daughter languages.

6.4. ROOT STRUCTURE PATTERNING

Comparison of Proto-Kartvelian with other Nostratic languages, especially Proto-Indo-European and Proto-Afrasian, makes it seem probable that the root structure patterning developed as follows (cf. Aronson 1997:938):

1. There were no initial vowels in the earliest form of Pre-Proto-Kartvelian. Therefore, every root began with a consonant. (At a later stage of development, however, loss of laryngeals resulted in roots with initial vowels: **HVC*- > **VC*-. Similar developments occurred in later Proto-Indo-European.)
2. Though originally not permitted, later changes led to the development of initial consonant clusters.
3. Two basic syllable types existed: (A) open syllables (**V* and **CV*) and (B) closed syllables (**VC* and **CVC*). Permissible root forms coincided exactly with these two syllable types. Loss of laryngeals and vowel syncope in early Proto-Kartvelian led to new roots in the form **C*-.
4. A verbal stem could either be identical with a root or it could consist of a root plus a single derivational morpheme added as a suffix to the root: **CVC*-*VC*-. Any consonant could serve as a suffix. (Inflectional endings could be of the form *-*V*, as in the case of the 3rd singular aorist ending *-*a.*)
5. Similar patterns occurred in nominal stems.

At this time, there were three fundamental stem types: (A) verbal stems, (B) nominal and adjectival stems, and (C) pronominal and indeclinable stems. That this distinction remained in Proto-Kartvelian proper is shown by the fact that prefixes mostly maintained their original structural identify, being only partially involved in the system of vowel gradation (cf. Gamkrelidze 1967:715) as well as by the fact that nominal stems were sharply distinguished from verbal stems in that they had the same ablaut state throughout the paradigm, while extended (that is, bimorphemic) verbal stems had alternating ablaut states according to the paradigmatic pattern (cf. Gamkrelidze 1967:714—715).

The phonemicization of a strong stress accent in Early Proto-Kartvelian disrupted the patterning outlined above. The positioning of the stress was morphologically distinctive, serving as a means to differentiate grammatical relationships. All vowels were retained when stressed but were either weakened (= "reduced-grade") or totally eliminated altogether (= "zero-grade") when unstressed: the choice between the reduced-grade versus the zero-grade depended upon the position of the unstressed syllable relative to the stressed syllable as well as upon the laws of syllabicity in effect at that time. Finally, it was at the end of this stage of development that the syllabic allophones of the resonants came into being and possibly the introvertive harmonic consonant clusters as well.

The stress-conditioned ablaut alternations gave rise to two distinct forms of extended stems:

State 1: Root in full-grade and accented, suffix in zero-grade: **CV́CC*-.
State 2: Root in zero-grade, suffix in full-grade and accented: **CCV́C*-.

These alternating patterns, which characterize the bimorphemic verbal stems, may be illustrated by the following examples (these are taken from Gamkrelidze 1966:74 and 1967:714):

State 1 Intransitive	State 2 Transitive
**der-k'-* 'to bend, to stoop'	**dr-ek'-* 'to bend'
**šker-t'-* 'to go out'	**škr-et'-* 'to extinguish'
**k'er-b-* 'to gather'	**k'r-eb-* 'to collect'

When a full-grade suffix was added to such stems, the preceding full-grade vowel was replaced by either reduced-grade or zero-grade:

State 1	State 2
**der-k'- > *dr̥-k'-a*	**dr-ek'- > *dr-ik'-e*
**šker-t'- > *škr̥-t'-a*	**škr-et'- > *škr-it'-e*
**k'er-b- > *k'r̥-b-a*	**k'r-eb- > *k'r-ib-e*

Nominal stems also displayed these patterns, though, unlike the bimorphemic verbal stems, the same ablaut state was fixed throughout the paradigm (these examples are from Gamkrelidze 1967:714):

State 1	State 2
**šax-l̥-* 'house'	**km-ar-* 'husband'
**ǯaγ-l̥-* 'dog'	**cm-el-* 'fat'
**k'wen-r̥-* 'marten'	**ǯm-ar-* 'vinegar'

6.5. GEORGIAN ALPHABET (MXEDRULI)

a ა	v ვ	k' კ	o ო	t' ტ	γ ღ	ʒ ძ	ǯ ჯ
b ბ	z ზ	l ლ	p' პ	wi ჳ	q' ყ	c' წ	h ჰ
g გ	ē ჱ	m მ	ž ჟ	u უ	š შ	č' ჭ	ō ჵ
d დ	t თ	n ნ	r რ	p ფ	č ჩ	x ხ	
e ე	i ი	j ჲ	s ს	k ქ	c ც	q ჴ	

Note: The following are no longer in use: ē (ჱ), j (ჲ), wi (ჳ), q (ჴ), ō (ჵ).

•••

The table of correspondences on the following pages is based upon Fähnrich—Sardshweladse 1995:14; Fähnrich 2007:14—15; Klimov 1964:20—25; Schmidt 1962; Gamkrelidze—Mačavariani 1982. See also Butskhrikidze 2002.

6.6. CORRESPONDENCES

Vowels:

Proto-Kartvelian	Georgian	Mingrelian	Laz	Svan
*a	a	o	o	a
*e	e	a	a	e
*i	i	i	i	i
*o	o	o	o	o
*u	u	u	u	u

Note: Long vowels are not included in the above table (for a discussion about the problems connected with the reconstruction of long vowels in Proto-Kartvelian and their development in the individual Kartvelian daughter languages, cf. Schmidt 1962:39—41).

Bilabials:

*b	b	b	b	b
*p	p	p	p	p
*p’	p’	p’	p’	p’

Dentals:

*d	d	d	d	d
*t	t	t	t	t
*t’	t’	t’	t’	t’

Velars:

*g	g	g	g	g
*k	k	k	k	k
*k’	k’	k’	k’	k’

Postvelars:

*ɢ	γ	γ	γ	γ
*q	x	x	x	q
*q’	q’	’ [ʔ] q’	q’ k’	q’

Glide:

*w	v	v	v	w

Dental Affricates and Sibilants:

Proto-Kartvelian	Georgian	Mingrelian	Laz	Svan
*ʒ (*ʒ)	ʒ	ʒ	ʒ	ʒ
*c (*c)	c	c	c	c
*c’ (*c̣)	c’	c’	c’	c’
*z (*z)	z	z	z	z
*s (*s)	s	s	s	s

Palato-alveolar Affricates and Sibilants:

*ǯ (*ʒ$_1$)	ʒ	ǯ	ǯ	ǯ
*č (*c$_1$)	c	č	č	č
*č’ (*c̣$_1$)	c’	č’	č’	č’
*ž (*z$_1$)	z	ž	ž	ž
*š (*s$_1$)	s	š	š	š

Palato-alveolar/Velar Clusters:

*ǯg (*ǯ)	ǯ	ǯg	ǯg	ǯg
*čk (*č)	č	čk	čk	čk
*č’k’ (*č̣)	č’	č’k’	č’k’	č’k’
*šk (*š)	š	šk	šk	šk

Laryngeal and Velar Fricatives:

*h	Ø	Ø	h Ø	Ø
*γ	γ	γ	γ	γ
*x	x	x	x	x

Nasals and Liquids:

*m	m	m	m	m
*n	n	n	n	n
*l	l	l	l	l
*r	r	r	r	r

APPENDIX:
THE PHONOLOGICAL SYSTEM OF MODERN GEORGIAN

The consonant system of Georgian is as follows (cf. Aronson 1990:20 and 1997: 929—931; Butskhrikidze 2002:85—88 and 101—102; Comrie [ed.] 1981:201; Vogt 1971:9):

Bilabial	b	p	p’	m							
Labial-dental								v			
Alveolar	d	t	t’	n	ʒ	c	c’	z	s	l	r
Palato-alveolar					ǯ	č	č’	ž	š		
Velar	g	k	k’					ɣ	x		
Uvular			q’								
Laryngal/Glottal									h		

The vowels are (cf. Aronson 1997:931; Butskhrikidze 2002:81; Vogt 1971:7—8):

i u
e o
a

There are two sets of homorganic consonant clusters in Georgian (cf. Butskhrikidze 2002:103—105; Butskhrikidze—van Heuven 2001; Fähnrich 1993:20—21; Vogt 1971:14). The homorganic consonant clusters function as single segments. Note: These can also be classed as (1) clusters of stops, affricates, and fricatives with velar stops and (2) clusters of stops, affricates, and fricatives with velar fricatives.

Labial/dorsal homorganic consonant clusters:

bg-	pk-	p’k’
bɣ-	px-	p’q’

Alveolar ~ Palato-Alveolar/dorsal homorganic consonant clusters:

dg	dɣ	tk	tx	t’k’	t’q’
ʒg	ʒɣ	ck	cx	c’k’	c’q’
ǯg	ǯɣ	čk	čx	č’k’	č’q’

The following are sometimes treated as homorganic consonant clusters as well:

zɣ	sx
žɣ	šx

There are also decessive consonant clusters, such as: *t’b-*, *t’k’b-*, *q’b-*, *grk’-*, *drk’-*, *xvd-*, *xd-*, etc.

THE PHONOLOGICAL SYSTEM OF MODERN SVAN

The consonant system of Svan is as follows (cf. Tuite 1997:7):

	Obstruents			Fricatives		Nasals	Sonants	
	voiced	aspirate	ejective	voiced	voiceless			
Labial	b	p	p’	(v)		m	w	
Dental	d	t	t’			n		
Alveolar	ʒ [dz]	c [ts]	c’ [ts’]	z	s		r	l
Palatal	ǯ [dʒ]	č [tʃ]	č’ [tʃ’]	ž [ʒ]	š [ʃ]		j	
Velar	g	k	k’					
Uvular		q	q’	ɣ [ʁ]	x [χ]			
Glottal					h			

Notes:
1. Unlike Georgian, Svan has /w/, while /v/ is missing.
2. The uvular obstruents /q/ and /q’/ are often pronounced as affricates (/qχ/ and /q’χ/, respectively).

The vowels are (cf. Tuite 1997:7):

Dialect	Short				Long			
Upper Bal	ä, e, i	ö, ü	a, ə	o, u	ā̱, ē, ī	ō̱, ū̱	ā, ə̄	ō, ū
Lower Bal	ä, e, i	ö, ü	a, ə	o, u				
Lent’ex	ä, e, i	ö, ü	a, ə	o, u				
Cholur	ä, e, i	ö, ü	a, ə	o, u	ā̱, ē, ī	ō̱, ū̱	ā, ə̄	ō, ū
Lashx	e, i		a, ə	o, u	ē, ī		ā, ə̄	ō, ū

Notes:
1. /ä/ = [æ], /ö/ = [œ], /a/ = [ɑ], /ü/ = [y].
2. Phonologically distinct long vowels are found in the Upper Bal, Cholur, and Lashx dialects of Svan.
3. The front rounded vowels /ö/ and /ü/ are often realized as diphthongs (/we/ and /wi/, respectively).
4. The vowel /ä/ causes preceding velar stops to be palatalized.

Although Svan imposes strict limitations on word initial consonant clusters, final consonant clusters can be quite complicated (cf. Tuite 1997:7—8).

CHAPTER SEVEN

A SKETCH OF PROTO-AFRASIAN PHONOLOGY

7.1. THE PROTO-AFRASIAN PHONOLOGICAL SYSTEM

Unlike the comparative-historical study of the Indo-European language family, which has a long history, the comparative-historical study of the Afrasian language family is still not far advanced, though enormous progress has been made in recent years. Even though the Semitic and Egyptian branches have been scientifically investigated rather thoroughly, several of the other branches are only now being examined, and there remain many modern Afrasian languages that are scarcely even known. Moreover, while a few of the daughter languages have written records going back many millennia, most of the daughter languages are only known from recent times. Given this state of affairs, it is not yet possible to reconstruct the Proto-Afrasian phonological system with absolute certainty in all areas. Though some series (labials, dentals, velars, etc.) are fairly well established, the sibilants, affricates, and fricative laterals, in particular, are far from being fully understood, and the reconstruction of labiovelars and postvelars is strongly contested. There are even more problems concerning the reconstruction of the vowels, though the Cushitic languages, especially East Cushitic, appear to have preserved the original system better than the other branches.

In general, I have followed the views of André Martinet (1975[1953]:248—261), David Cohen (1968:1299—1306), and Igor M. Diakonoff (1992:5—35), though I have made minor adjustments to their proposals (for example, the reconstruction of a series of palatalized velar stops for Proto-North Erythraean — see below, §7.9) on the basis of my own research.

One of the most notable characteristics of Afrasian consonantism is the system of triads found in the stops and affricates — each series (except the lateralized affricates) is composed of three contrasting members: (1) voiceless (aspirated), (2) voiced, and (3) glottalized (that is, ejectives — these are the so-called "emphatics" of Semitic grammar). The lateralized affricate series probably lacked a voiced member. Another significant characteristic is the presence of a glottal stop, a voiceless laryngeal fricative, voiced and voiceless velar fricatives, and voiced and voiceless pharyngeal fricatives. Proto-Afrasian may also have had a series of postvelars (**q*, **ɢ*, **q'*).

The Proto-Afrasian phonological system may tentatively be reconstructed as follows (cf. Diakonoff—Porxomovsky—Stolbova 1987:9—29, especially p. 12; Diakonoff 1965:18—29, 1984, 1988:34—41, and 1992:5—35, especially p. 6; D. Cohen 1968:1300—1306; Orël—Stolbova 1995:xv—xxvii, especially p. xvi; Ehret 1995; Takács 2011a):

Stops and Affricates:

p	t	c	t^y	t͡ɬ	k	k^w	(q)		
b	d	ʒ	d^y		g	g^w	(ɢ)		
p’	t’	c’	$t’^y$	t͡ɬ’	k’	$k’^w$	(q’)	($q’^w$)	ʔ

Fricatives:

f	s	s^y		x	x^w		h	ħ
	z			γ	($γ^w$)			ʕ
	s’							

Glides:	w	y				
Nasals and Liquids:		m	n	ŋ	l	r
Vowels:		i	e	a	o	u
		ii	ee	aa	oo	uu

Note: The voiceless stops and affricates were non-phonemically aspirated.

According to Diakonoff (1975:134—136), Proto-Afrasian had a vertical vowel system of **ə* and **a* as well as a series of syllabic resonants. In my opinion, the evidence from the non-Semitic branches of Afrasian does not appear to support the reconstruction of syllabic resonants for Proto-Afrasian. Diakonoff does not reconstruct long vowels for Proto-Afrasian.

In their *Hamito-Semitic Etymological Dictionary*, Orël—Stolbova (1995:xvi) reconstruct a slightly reduced phonological system for Proto-Afrasian. They do not reconstruct a series of labialized velars, while they substitute the affricates **č*, **c̓* (= **č’*), **ǯ* for my **t^y*, **$t’^y$*, **d^y*, respectively. On the other hand, they posit a full set of vowels (Orël—Stolbova 1995:xxi), as does Ehret (1995:55—57) — though, unlike Orël—Stolbova, Ehret posits phonemic long vowels as well:

Orël—Stolbova	i	ü			u
			e		o
				a	
Ehret	i, ii				u, uu
			e, ee		o, oo
				a, aa	

Other sounds have also been posited for Proto-Afrasian by several scholars — these include prenasalized labials (cf. Greenberg 1958:295—302 and 1965:88—92), postvelar stops, affricates, and/or fricatives (cf. Diakonoff 1974:595 and 1988:34,

39), and additional sibilants (Diakonoff 1965:21). Though it is by no means impossible that some of these sounds may have belonged to the Proto-Afrasian phonological system, in my opinion, the arguments advanced so far to support their reconstruction are not entirely convincing.

7.2. THE EMPHATICS

In the Semitic branch, the so-called "emphatics" have three different realizations: (A) in Arabic, the emphatics have been described in the relevant literature as either uvularized (cf. Catford 1977b:193) or pharyngealized consonants (cf. Al-Ani 1970:44—58; Catford 1977b:193; Chomsky—Halle 1968:306); (B) in the Modern South Arabian languages (cf. Johnstone 1975:6—7, §2.1.2), the Semitic languages of Ethiopia (cf. Moscati 1964:23—24, §8.2), and several Eastern Neo-Aramaic dialects (such as, for example, Urmian Nestorian Neo-Aramaic and Kurdistani Jewish Neo-Aramaic), the emphatics are glottalized — the glottalization is weak in Urmian Nestorian Neo-Aramaic; and (C) in several other Neo-Aramaic dialects (such as, for example, Ṭūr-ʿAbdīn), the emphatics are realized as unaspirated voiceless stops (cf. Dolgopolsky 1977:1) — here, the non-emphatic voiceless stops are distinguished from the emphatics by the presence of the feature of aspiration.

Circumstantial evidence indicates that the emphatics may also have been glottalized in Akkadian, Ancient Hebrew (cf. Rendsburg 1997:73), and the oldest Aramaic: (A) In Akkadian, when two emphatics cooccurred in a root, one of them was changed into the corresponding non-emphatic (Geers' Law), thus: *ṭ* ~ *ḳ*/*ṣ* > *t* ~ *ḳ*/*ṣ*; *ḳ* ~ *ṣ* > *k* ~ *ṣ*; *ḳ* ~ *ṭ* > *ḳ* ~ *t* (cf. Ungnad—Matouš 1969:27). Now, a constraint similar to that described by Geers' Law is found in several languages having ejectives (cf. Hopper 1973:160—161). According to this constraint, two ejectives cannot cooccur in a root. Thus, if we take the emphatics of Akkadian to have been ejectives, then Geers' Law finds a perfectly natural explanation as a manifestation of this constraint. (B) Pharyngealization is not incompatible with voicing, but glottalization is (cf. Greenberg 1970:125—127, §2.2). Thus, Arabic has voiced as well as voiceless emphatics (cf. Al-Ani 1970:44—58; Ambros 1977:8—10 and 13—14). In Hebrew and Aramaic, however, the emphatics are never voiced (cf. Cantineau 1952:93; Moscati 1964:23—24), and the same is most likely true for Akkadian and Ugaritic as well. (C) Pharyngealization is always accompanied by the backing of contiguous vowels (cf. Hyman 1975:49; Ladefoged 1971:63—64). Similar backing is sometimes also found in conjunction with glottalization. Indeed, in all of the Neo-Aramaic dialects mentioned above, vowels are always backed when next to emphatic consonants, regardless of how the emphatics are realized. However, while backing of adjacent vowels is a mandatory corollary of pharyngealization, it is optional with glottalization. Therefore, since the emphatics of Arabic are pharyngealized, contiguous vowels are always backed (cf. Al-Ani 1970:23—24; Cantineau 1952:92; Martinet 1975[1959]:237; Bellem 2007:43—47). No such backing is observable in either Akkadian or Hebrew (cf. Cantineau 1952: 93; Martinet 1975[1959]:237—238; Moscati 1964:23—24).

Both Greenberg (1970:127) and Martinet (1975[1959]:251) have pointed out that it is common for languages having ejectives to lack the bilabial member (cf. also Gamkrelidze 1978:17 and 1981:587—589). Now, it is extremely unlikely that Proto-Semitic possessed a bilabial emphatic (cf. Cantineau 1952:80—81; Moscati 1964:25). A gap at this point of articulation would be easy to understand if the emphatics had been ejectives in Proto-Semitic. Though an emphatic bilabial must be reconstructed for Proto-Afrasian, it was extremely rare (cf. Ehret 1995:77). Such a low frequency of occurrence agrees fully with the distributional patterning of bilabial ejectives in attested languages having such sounds.

The cumulative evidence leaves little doubt that the emphatics were glottalized (ejectives) in Proto-Semitic and not pharyngealized as in Arabic. Cf. Bellem (2007), Bergsträsser (1928:5 and 1983:4), Cantineau (1952:91—94), Del Olmo Lete (2003: 89), Hasselbach (2017:96), Huehnergard (2005:165—166), Kogan (2011a:59—61), Kouwenberg (2003), Martinet (1975[1959]:238 and 1975[1953]:250—252), Rubin (2010:24), Steiner (1977:155), R. Stempel (1999:64—67), and Zemánek (1990 and 1996:50—53), among others. Lipiński (1997:105—106), however, supports the view that pharyngealization was primary. According to Dolgopolsky (1977:1—13), the pharyngealized emphatics of Arabic developed from earlier ejectives as follows:

1. The earliest Arabic inherited the triple contrast voiceless aspirated ~ voiced ~ glottalized from Proto-Semitic.
2. First, vowels were backed when next to emphatic consonants.
3. Next, the glottalization was weakened and eventually lost. Non-emphatic voiceless consonants were then distinguished from emphatics by the presence of the feature of aspiration. Furthermore, vowels were backed when next to emphatics but not when next to non-emphatics. (This is the stage of development reached by the Neo-Aramaic dialect of Ṭūr-ʿAbdīn.)
4. Lastly, aspiration was lost, and the emphatics were distinguished from the non-emphatic voiceless consonants solely by backing (that is, pharyngealization).

The evidence from the other branches of Afrasian supports the contention that the emphatics were ejectives not only in Proto-Semitic but in Proto-Afrasian as well (cf. D. Cohen 1968:1301—1303; Diakonoff 1988:35).

The emphatics were lost as a separate series in Ancient Egyptian (cf. Loprieno 1995:32; Vergote 1971:43). The velar emphatic **k'* became the voiceless postvelar stop *q*, while the remaining emphatics merged with the plain (unaspirated) voiceless consonants. The developments probably went as follows:

1. The earliest Egyptian inherited the triple contrast voiceless aspirated ~ voiced ~ glottalized from Proto-Afrasian.
2. First, the voiced consonants became devoiced. The resulting system had the contrast voiceless aspirated ~ voiceless unaspirated ~ glottalized.
3. Next, the emphatics other than **k'* became deglottalized and merged with the voiceless unaspirated stops. It is not difficult to understand why **k'* would have

remained longer than the other emphatics since back articulation (velar and postvelar) is the unmarked point of articulation for ejectives (cf. Greenberg 1970:127—129, §2.3).

4. Finally, **k'* became *q*. (We may note that a similar development is found in several East Cushitic languages, Somali being one example.)

In the modern Berber languages, the emphatics are pharyngealized as in Arabic (cf. D. Cohen 1968:1302; Penchoen 1973:7, §2.3.1[a]; Lipiński 1997:105; Kossmann—Stroomer 1997:464; Kossmann 2012:25; Frajzyngier 2012:509). Both voiced and voiceless emphatics exist. We may assume that the pharyngealized emphatics found in the Berber languages are due to secondary developments. No doubt, the emphatics developed in Berber in much the same way as they did in Arabic.

Of the modern Chadic languages, Angas, Dangaleat, Ga'anda, Higi, Margi, Tera, and Sayanci, for instance, have implosives, while Hausa has implosives in the bilabial and dental series but ejectives in the sibilant and velar series corresponding to the Semitic emphatics (for details, cf. Ruhlen 1975). According to Newman (1977:9, §2.1), a series of implosives is to be reconstructed here for Proto-Chadic: **ɓ*, **ɗ̆*, **ɠ̆* (Newman writes **'J*). Jungraithmayr—Shimizu (1981:19—20), however, reconstruct a system for Proto-Chadic similar to what is found in Hausa, with bilabial and dental implosives and sibilant and velar ejectives. Orël—Stolbova (1995:xviii) reconstruct ejectives for Common Chadic: **ṭ'*, **k'* (they write **ṭ*, **k̦*, respectively; they do not reconstruct a bilabial member). Finally, Ehret (1995) mostly follows Jungraithmayr—Shimizu. Martinet (1970:113, §4.28) notes that ejectives can develop into implosives through a process of anticipation of the voice of the following vowel, thus (see also Fallon 2002:281—284):

p' t' k' > ɓ ɗ̆ ɠ̆

Thus, if we follow Martinet, as I think we must, the implosives found in various Chadic daughter languages can be seen as having developed from earlier ejectives at the Proto-Chadic level.

The Cushitic and Omotic languages provide the strongest evidence in favor of interpreting the emphatics of Proto-Afrasian as ejectives. The Cushitic languages Awngi (Awiya) and Galab possess neither implosives nor ejectives and can, therefore, be left out of consideration since they do not represent the original state of affairs. Of the remaining Cushitic languages, Beja (Beḍawye), for example, has the voiceless and voiced retroflexes *ṭ* and *ḍ* (cf. Maddieson 1984:316, no. 261; Ruhlen 1975:167); Oromo (Galla) has the implosive *ɗ̆* plus the ejectives *p'*, *t'*, *č'*, *k'* (*t'* is found in loanwords or in roots of a descriptive nature [cf. Sasse 1979:26]) (cf. Ruhlen 1975:197 — Ruhlen gives long and short retroflex implosives); Bilin has the ejectives *t'*, *č'*, *k'* (cf. Ruhlen 1975:169); Somali has the retroflex *ḍ* (from earlier **d*) and the voiceless postvelar *q* (uvular stop with voiced, voiceless, and fricative allophones, all from earlier **k'*) (cf. Maddieson 1984:314, no. 258 — Maddieson gives long and short laryngealized voiced retroflexes; Ruhlen 1975:269 — Ruhlen gives long and short dental implosives; Sasse 1979:25 and 47); and Iraqw has the

affricate ejective *c'* and the voiceless postvelars *q* and *q*^{w} (from earlier **k'* and **k'*^{w}, respectively) plus, marginally, *ɓ* and *ɗ* (cf. Maddieson 1984:315, no. 260; Ruhlen 1975:210); Dahalo has the ejectives *p'*, *t'*, *c'*, *t͡ɬ'*, (*č'*), *k'*, and *k'*^{w} (cf. Ehret 1980:126). For information on the East Cushitic languages, cf. Sasse 1979 and Hudson 1989; for the Southern Cushitic languages, cf. Ehret 1980.

Of the modern Omotic languages, Kafa (Kefa) has the ejectives *p'*, *t'*, *c'*, *k'* (cf. Maddieson 1984:317, no. 264; Ruhlen 1975:219); Dizi has the ejectives *t'*, *č'*, *k'* (cf. Maddieson 1984:317, no. 263); Welamo has the ejectives *p'*, *t'*, *c'*, *k'*^{y}, *k'*, *s'* (cf. Ruhlen 1975:288); while Hamar (Hamer) has the velar ejective *k'* plus the implosives *ɓ*, *ɗ*, and *ɠ* (cf. Maddieson 1984:318, no. 265). For additional information on Kafa, Dizi, and Hamar, see Bender (ed.) 1976; for other Omotic languages, cf. Hayward (ed.) 1990 and Amha 2012:434—438. For details about the development of the emphatics in the Afrasian daughter languages as a group, cf. Diakonoff 1965:18—29, 1988:34—41, and 1992:56—64; D. Cohen 1968:1301—1303.

7.3. BILABIALS

There can be no question that Proto-Semitic contained **p*, **b*, and **m*. The *f* found in Arabic, South Arabian, and Ethiopian Semitic is an innovation and can easily be derived from earlier **p* (cf. Moscati 1964:24—25, §8.6; O'Leary 1923:62; Lipiński 1997:109). Several modern Eastern Arabic dialects have *p* in loanwords (cf. Lipiński 1997:109). In Hebrew and Aramaic, /p/ and /b/ have the non-phonemic allophones /φ/ and /β/, respectively (cf. Bergsträsser 1928:37—38 and 62, 1983:51 and 79; Lipiński 1997:113—114; Moscati 1964:26—27, §8.10; O'Leary 1923:88—89; Rendsburg 1997:74—75). Ethiopian Semitic languages have a voiceless bilabial emphatic *p'*, but this is most likely of Cushitic origin and is not an inherited phoneme (cf. Lipiński 1997:110).

Semitic correspondences (cf. Bergsträsser 1928:4 and 1983:3; Gray 1934:10—11; Kogan 2011a:55; Lipiński 1997:109—116; Moscati 1964:24—27 and 43—45; O'Leary 1923:62—63; R. Stempel 1999:44—45; Brockelmann 1908—1913.I:136):

Proto-Semitic	*p	*b	*m
Akkadian	p	b	m
Ugaritic	p	b	m
Hebrew	פ /p/	ב /b/	מ /m/
Aramaic	פ /p/	ב /b/	מ /m/
Arabic	ف /f/	ب /b/	م /m/
Epigraphic South Arabian	f	b	m
Geez / Ethiopic	f	b	m

Notes:
1. Each language is given in traditional transcription.
2. Hebrew, Aramaic (= Hebrew), and Arabic scripts are included in this as well as in the following tables in addition to transliterations.
3. The voiceless stops were probably voiceless aspirates (that is, /pʰ/, /tʰ/, /kʰ/) in both Proto-Semitic (cf. Cantineau 1952:90—91; Martinet 1975[1953]:250) and Proto-Afrasian (cf. D. Cohen 1968:1303). The aspiration was phonemically non-distinctive.

The material from the other Afrasian branches supports the assumption that Proto-Afrasian also had the bilabials **p*, **b*, and **m*.

Diakonoff (1965:20) reconstructs an emphatic bilabial, which he writes **ṗ*, for Proto-Semitic. However, as he himself admits, the evidence for this sound is extremely weak. It is best to agree with Cantineau (1952:80—81) and Moscati (1964:25, §8.7) that an emphatic bilabial should not be reconstructed for Proto-Semitic. However, a glottalized bilabial must be reconstructed for Proto-Afrasian (cf. Diakonoff 1988:35; Ehret 1995:77). This sound was characterized by an extremely low frequency of occurrence.

According to Greenberg (1958:295—302 and 1965:88—92), two additional labials should be reconstructed for Proto-Afrasian: **f* and **^{m}b*. While he has made a strong case for **f* separate from **p*, his theories concerning **^{m}b* are not convincing and have been successfully argued against by Illič-Svityč (1966a:9—34). Illič-Svityč considers **^{m}b* to contain a prefix **m-*.

Afrasian correspondences (cf. Diakonoff 1988:35 and 1992:10—13; Ehret 1995:77—79; Orël—Stolbova 1995:xviii—xix and xx; Takács 2011a:98):

Proto-Afrasian	*p	*b	*p’	*f	*m
Proto-Semitic	*p	*b	*b	*p	*m
Ancient Egyptian	p 𓊪	b 𓃀	b 𓃀	f 𓆑	m 𓅓
Proto-Berber	*f	*b̲ (?)	?	*f	*m
Proto-East Cushitic	*f	*b	?	*f	*m
Proto-Southern	*p	*b	*p’	*f	*m
Proto-Chadic	*p	*b	*p’	*f	*m

Note: Ancient Egyptian is given in traditional transcription. It should be noted, however, that the phonemes traditionally transcribed as /b/, /d/, /d̲/, /g/, /q/ were probably the voiceless unaspirated consonants /p/, /t/, /č/, /k/, /q/, respectively, while the phonemes traditionally transcribed as /p/, /t/, /t̲/, /k/ were probably the voiceless aspirated consonants /pʰ/, /tʰ/, /čʰ/, /kʰ/, respectively (cf. J. P. Allen 2013:37—56; Loprieno 1995:32—34 [Loprieno interprets the traditional voiced stops as ejectives]; Vergote 1971:43). The most comprehensive treatment of Egyptian phonology is Peust 1999 — Peust (1999:83—84) supports Vergote’s views on this matter.

7.4. DENTALS

It is quite evident from the following correspondences that Proto-Semitic had **t*, **d*, **t'*, and **n*. In Hebrew and Aramaic, /t/ and /d/ have the non-phonemic allophones /θ/ and /ð/, respectively (cf. Moscati 1964:26—27, §8.10). In Akkadian, Hebrew, and Epigraphic South Arabian, *n* becomes *m* in mimation (cf. Diakonoff 1965:28, note 2, and 61—62; Moscati 1964:96—100).

Semitic correspondences (cf. Moscati 1964:43—45; Lipiński 1997:116—117):

Proto-Semitic	*t	*d	*t'	*n
Akkadian	t	d	ṭ	n
Ugaritic	t	d	ṭ	n
Hebrew	ת /t/	ד /d/	ט /ṭ/	נ /n/
Aramaic	ת /t/	ד /d/	ט /ṭ/	נ /n/
Arabic	ت /t/	د /d/	ط /ṭ/	ن /n/
Epigraphic South Arabian	t	d	ṭ	n
Geez / Ethiopic	t	d	ṭ	n

The data from the remaining Afrasian branches leave no doubt that Proto-Afrasian also had the dentals **t*, **d*, **t'*, and **n*. Secondary palatalization of the dentals before front vowels is a widespread phenomenon, being especially common in the Semitic languages of Ethiopia and in Chadic.

Afrasian correspondences (cf. Diakonoff 1988:35 and 1992:13—14; Ehret 1995:120—124; Orël—Stolbova 1995:xviii—xix and xx; Takács 2011a:98):

Proto-Afrasian	*t	*d	*t'	*n
Proto-Semitic	*t	*d	*t'	*n
Ancient Egyptian	t 𓏏	d 𓂧	d 𓂧	n 𓈖
Proto-Berber	*t	*d	*ṭ *ḍ	*n
Proto-East Cushitic	*t	*d	*ɗ	*n
Proto-Southern Cushitic	*t *ṭ	*d	*ɗ *t'	*n
Proto-Chadic	*t	*d	*t'	*n

Note: The reconstruction of Proto-Berber is not very advanced. Consequently, the reflexes given in this and other tables should be considered provisional.

7.5. DENTAL AFFRICATES

On the surface, the Semitic correspondences appear to indicate that a series of sibilants should be reconstructed here for Proto-Semitic, and, as a matter of fact,

sibilants are posited in the standard handbooks (cf. Bergsträsser 1928:4 and 1983:3; Brockelmann 1908—1913.I:128—136; O'Leary 1923:53—62; Gray 1934:8; Moscati 1964:33—37; W. Wright 1890:57—64). There is some evidence, however, that at least some examples involving this series were originally composed of dental affricates instead (cf. M. Cohen 1947:141, 143, and 145; Diakonoff 1965:20—21, 1974:595, and 1992:16—22, 36—55; Faber 1981:233—262; Kogan 2011a:65—69; Martinet 1975[1953]:253—254; Takács 2011a:21—26): **c* /t͡s/, **ʒ* /d͡z/, and **c'* /t͡s'/. This does not mean that the independent existence of sibilants in the Semitic parent language is to be excluded. On the contrary, in addition to the dental affricates, Proto-Semitic may also have had a full set of sibilants, namely, **s*, **z*, **s'*, and **s^{y}* (traditional **s*, **z*, **ṣ*, and **š*), though opinions differ on this matter.

The primary evidence for earlier dental affricates comes from Hebrew and Akkadian (cf. Diakonoff 1965:20—21). First the emphatic sibilant, צ /ṣ/, is traditionally pronounced as a dental affricate in Hebrew, and, as noted by Cantineau (1952:83), this pronunciation is not a recent or secondary development. Next, it is now known that the Hittite cuneiform syllabary was borrowed at the beginning of the second millennium BCE directly from the form of Old Akkadian then written in Northern Syria (cf. Gamkrelidze 1968:91—92) and not from Hurrian as previously thought (cf. Sturtevant 1951:2—3, §5). The Hittite syllabary contains signs that are transliterated with a *z* but which, in fact, represent the dental affricate /t͡s/ (cf. Sturtevant 1951:14—15, §25). This seems to indicate that the <z> of Old Akkadian was pronounced as an affricate (cf. Martinet 1975[1953]:254). Also worth noting is the fact that the Hittite scribes employed the cuneiform signs containing <š> to represent /s/ (cf. Sturtevant 1951:25, §50). Since the Akkadian cuneiform syllabary contained signs traditionally transliterated as *s* in addition to those transliterated as *š*, we must conclude that the Hittite scribes chose the latter signs because they were closer to their sibilant than the former. We may venture a guess that the Hittites chose the *š*-signs because the *s*-signs represented affricates in Akkadian at the time when they adopted the cuneiform writing system. This conclusion is supported by the Hurrian evidence, where, according to Diakonoff (1965:21), the cuneiform signs with <z> and <s> are used to denote affricates (see also Diakonoff—Starostin 1986:13—15 for a discussion of Hurrian phonology and 1986:11—13 for a discussion of the closely-related Urartian; see also Speiser 1941:50—68).

Additional evidence for affricate pronunciation comes from Egyptian material dating from the second millennium BCE. In transcribing Semitic words and names, Egyptian fairly consistently uses *ṯ* (= /č/ or, better, /č^{h}/) for (traditional) *s* in the Semitic words and *ḏ* (= /ǯ/ or, better, /č/) for (traditional) *z* and *ṣ* in the Semitic words (cf. Diakonoff 1988:36; for examples, cf. Albright 1934:33—67).

Finally, Cantineau (1952:83) and M. Cohen (1947:145) briefly mention the fact that Proto-Semitic **c'* (traditional **ṣ*) is mostly pronounced as either an affricate or a dental stop in the Semitic languages of Ethiopia.

For details on the developments in the Semitic daughter languages, see Diakonoff 1992:36—55.

Note David Cohen's (1968:1304) remarks, which summarize the above points rather nicely:

> As for the three phonemes that are, at the present time, realized everywhere as sibilants, it seems necessary to assume that they were formerly realized as affricates. Such a pronunciation, at least for the emphatic member, is traditional among certain Jews in reading Biblical Hebrew. Furthermore, it is attested in Ethiopic. There are important arguments in favor [of such an interpretation] on the basis of external evidence: in particular, the Hittite use of the Akkadian sign interpreted as *z* to indicate an affricate.

Semitic correspondences (cf. Moscati 1964:43—45; Lipiński 1997:122—126; Kogan 2011a:55):

Proto-Semitic	*c	*ʒ	*c’
Akkadian	s	z	ṣ
Ugaritic	s	z	ṣ
Hebrew	ס /s/	ז /z/	צ /ṣ/
Aramaic	ס /s/	ז /z/	צ /ṣ/
Arabic	س /s/	ز /z/	ص /ṣ/
Epigraphic South Arabian	s³	z	ṣ
Geez / Ethiopic	s	z	ṣ

In the other branches of Afrasian, sibilants, affricates, and dentals correspond to Proto-Semitic **c* /t͡s/, **ʒ* /d͡z/, and **c’* /t͡s’/ (cf. M. Cohen 1947:141—147; Ehret 1995:251—254; Diakonoff 1965:26). The developments found in all branches of Afrasian can best be accounted for by reconstructing a series of dental affricates for Proto-Afrasian (cf. D. Cohen 1968:1304; Diakonoff 1988:36—39). It may be noted that this series is well preserved in Southern Cushitic and that it has even endured to the present day in Dahalo (cf. Ehret 1980:33). Finally, it should be mentioned here that affricates have arisen through secondary developments in all branches of Afrasian.

Afrasian correspondences (cf. Diakonoff 1988:36—39 and 1992:16—22, 36—55; Ehret 1995:251—254; Orël—Stolbova 1995:xix; Takács 2011a:98):

Proto-Afrasian	*c	*ʒ	*c’
Proto-Semitic	*c	*ʒ	*c’
Ancient Egyptian	s 𓋴	z 𓊃	d̲ 𓂝
Proto-Berber	*s	*z	*ḍ *ẓ
Proto-East Cushitic	*s	*z	*ɗ₁
Proto-Southern Cushitic	*c	*ʒ	*c’
Proto-Chadic	*c	*ʒ	*c’

Note: Ehret (1980) writes **ts*, **dz*, **ts’* for Proto-Southern Cushitic.

7.6. PALATALIZED ALVEOLARS

Opinions differ as to whether a series of palato-alveolar affricates (that is, **č* /t͡š/, **ǰ* /d͡ž/, and **č'* /t͡š'/) or palatalized alveolars (that is, **t^{y}*, **d^{y}*, **t'^{y}*) are to be reconstructed for Proto-Afrasian. Diakonoff (1988:34 and 36—39), for example, favors palato-alveolar affricates, which he writes **č*, **ǰ*, **č̣*, as do Kogan (2011a), Ehret (1995:251—254), Takács (2011a:27—31), and Orël—Stolbova (1995:xvi), while David Cohen (1968:1304) favors palatalized alveolars — Cohen notes:

> There is a problem with the series generally defined, based upon [the evidence of] Arabic, as consisting of interdentals. But, outside of Common Arabic, these sounds are represented, depending upon the language, sometimes as palato-alveolar fricatives, sometimes as sibilants, and sometimes as plain dental stops. Such correspondences can only be explained clearly if the series in question is considered to have been in Proto-Hamito-Semitic, as well as in Proto-Semitic, made up of palatals.

Moscati (1964:27—30) reconstructs interdentals (IPA [θ], [ð], and [θ']) for Proto-Semitic on the basis of the Arabic reflexes, and this is the reconstruction found in all of the standard handbooks (cf. Bergsträsser 1928:4 and 1983:3; Brockelmann 1916:53—54; Gragg—Hoberman 2012:153; Gray 1934:8—10; O'Leary 1923:53—60; Lipiński 1997:117—122). Cantineau (1952:81—82), however, reconstructs earlier (palato-)alveolars (*apicales «à pointe basse»*) — he notes:

> But it is difficult to determine whether it is a question at the Semitic level of true fricatives or of affricates…

Martinet (1975[1953]:257—258) posits palatalized alveolar stops for Proto-Semitic. Martinet's reconstructions, which have as their basis not only the data from the Semitic daughter languages but also Martinet's extensive knowledge of phonology in general, this knowledge being derived from the study of a wide variety of languages from different language families, surely comes closest to the truth. Thus, the developments found in the Semitic daughter languages can best be explained by reconstructing a series of palatalized alveolar stops for Proto-Semitic: **t^{y}*, **d^{y}*, **t'^{y}*. R. Stempel (1999:46—50) also posits palatalized alveolars here. Ehret (1995:251—254, especially the charts on pp. 251 and 253) reconstructs interdentals for Proto-Semitic but leaves open the possibility that this series may have been composed of palatalized alveolars instead.

The oldest Akkadian may have preserved this series. According to Gelb (1961:35—39), Old Akkadian *š*$_{3}$ corresponds to Hebrew *š* and Arabic *ṯ* (from Proto-Semitic **t^{y}*, traditional **ṯ*), while *š*$_{4}$ may correspond to Hebrew *z* and Arabic *ḏ* (from Proto-Semitic **d^{y}*, traditional **ḏ*). *š*$_{3}$ and *š*$_{4}$ are distinct from *š*$_{1}$ and *š*$_{2}$, which represent Proto-Semitic **š* and **t͡ɬ* (traditional **ś* [Diakonoff 1988:34 writes **ŝ*]), respectively (cf. Gelb 1961:35). Cf. here also Diakonoff 1965:21, note 25, and 1992:36—55.

Semitic correspondences (cf. Moscati 1964:43—45; Lipiński 1997:117—122; R. Stempel 1999:46—50; Kogan 2011a:55):

Proto-Semitic	*tʸ	*dʸ	*t'ʸ
Akkadian	š	z	ṣ
Ugaritic	t̲	d̲	ṯ
Hebrew	שׁ /š/	ז /z/	צ /ṣ/
Aramaic	ת /t/	ד /d/	ט /ṭ/
Arabic	ث /t̲/	ذ /d̲/	ظ /ẓ/
Epigraphic South Arabian	t̲	d̲	ẓ
Geez / Ethiopic	s	z	ṣ

Note: In Epigraphic South Arabian, Proto-Semitic **t'ʸ* became an interdental emphatic (cf. R. Stempel 1999:46—50; Lipiński 1997:117—122; Kogan—Korotayev 1997:222). This is transcribed as both /ẓ/ and /ṯ/ in the literature.

In the other branches of Afrasian, palato-alveolar affricates, dentals, and palatalized alveolar stops correspond to Proto-Semitic **tʸ*, **dʸ*, **t'ʸ*. The correspondences from all branches of Afrasian can more effectively be explained by setting up a series of palatalized alveolar stops for the Afrasian parent language than by setting up a series of palato-alveolar affricates (cf. D. Cohen 1968:1304) — note that, in addition to Proto-Semitic, such a reconstruction is strongly supported by Proto-Southern Cushitic. On this basis, in addition to other evidence, Ehret (1995:251) favors such an interpretation as well — Ehret writes **c, *j, *c'* (= **tʸ*, **dʸ*, **t'ʸ*).

Afrasian correspondences (cf. Diakonoff 1988:36—39, 1992:16—22 and 36—55; Ehret 1995:251—254; Orël—Stolbova 1995:xix; Takács 2011a:98):

Proto-Afrasian	*tʸ	*dʸ	*t'ʸ
Proto-Semitic	*tʸ	*dʸ	*t'ʸ
Ancient Egyptian	t̲ 𓊃	d̲ 𓈙	d̲ 𓈙
Proto-Berber	*s	*z	*ḍ *ẓ
Proto-East Cushitic	*t	*d	*ɗ$_1$
Proto-Southern Cushitic	*tʸ	*dʸ	*t'ʸ
Proto-Chadic	*č	*ǯ	*č'

7.7. SIBILANTS

The Semitic sibilants have been the subject of much controversy (cf. especially Beeston 1962:222—231; Buccellati 1997b:18—22; Faber 1981:233—262; Murtonen 1966:135—150). Though there are many points of agreement among

Semiticists, there is still no consensus on the number of sibilants to be reconstructed for Proto-Semitic. The sibilants remain one of the most perplexing problems in both Semitic and Afrasian comparative phonology.

According to the traditional reconstruction, Proto-Semitic is assumed to have had the following sibilants (cf. Moscati 1964:33—37; Lipiński 1997:122—129): **s*, **z*, **ṣ*, **š*, and **ś*, to which Diakonoff (1965:21) tried to add **s̲*. **s* and **š* merged into *s* in Classical Arabic (cf. Moscati 1964:36; Lipiński 1997:124) and Ethiopian Semitic (cf. Moscati 1964:37, §8.37; Lipiński 1997:125—126). However, *š* has reappeared in modern Arabic dialects and modern Ethiopian Semitic languages through secondary developments (cf. Lipiński 1997:125—126).

As noted in the discussion of the dental affricates, it seems fairly certain that the traditional **s*, **z*, and **ṣ* are to be at least partially reinterpreted as the dental affricates **c*, **ʒ*, and **c'*, respectively, at the Proto-Semitic level.

Next, following Martinet (1975[1953]:253), **ś* is to be reinterpreted as a voiceless lateralized affricate **t͡ɬ* (see also Steiner 1977, though Steiner prefers a fricative lateral **ɬ* over an affricate).

Finally, it may be noted that Diakonoff's (1965:21) attempt to reconstruct an additional sibilant for Proto-Semitic, which he writes **s̲*, has received little support from fellow Semiticists. Diakonoff set up this sibilant on a purely theoretical basis, noting that it was not preserved in any of the Afrasian daughter languages, with the possible exception of the most ancient stage of Old Akkadian, where it is alleged to have become *š* [ś].

Semitic correspondences (cf. O'Leary 1923:53; Gray 1934:11; Moscati 1964: 44—45; R. Stempel 1999:51—56; Kogan 2011a:55):

Proto-Semitic	*s	*z	*s'	*sʸ
Akkadian	s	z	ṣ	š
Ugaritic	s	z	ṣ	š
Hebrew	ס /s/	ז /z/	צ /ṣ/	שׁ /š/
Aramaic	ס /s/	ז /z/	צ /ṣ/	שׁ /š/
Arabic	س /s/	ز /z/	ص /ṣ/	س /s/
Epigraphic South Arabian	s³	z	ṣ	s¹
Geez / Ethiopic	s	z	ṣ	s

Certain correspondences between Semitic and the other branches of Afrasian indicate that, at the very least, the sibilants **s* and **sʸ* are to be reconstructed for Proto-Afrasian, and these are the two sibilants reconstructed by Diakonoff (1988:34 and 1992:6), though he writes **š* instead of **sʸ*. Orël—Stolbova (1995:xvi), on the other hand, reconstruct only **s* for Proto-Afrasian, while Ehret (1995:120—124 and 251—253) reconstructs the most complete set: **s*, **z*, **s'*, and **š*. The following correspondences are based primarily upon Ehret's work, though I disagree with him concerning the Semitic reflexes, and I write **sʸ* for his **š* — these are all very, very tentative:

Proto-Afrasian	*s	*z	*s’	*s^{y}
Proto-Semitic	*s	*z	*s’	*s^{y}
Ancient Egyptian	s 𓊃	z 𓈙	?	š 𓋴 s 𓊃
Proto-Berber	*s	*z	*ẓ	*s
Proto-East Cushitic	*s	*z	?	*s
Proto-Southern Cushitic	*s	*z	*c’	*š
Proto-Chadic	*s	?	*s’	*s

7.8. FRICATIVE LATERALS/LATERALIZED AFFRICATES

The Modern South Arabian languages contain the fricative laterals *ś* and *ź*, that is, /ɬ/ and /ɮ/, respectively (cf. Johnstone 1975:7, §2.1.3; Steiner 1977:20). The voiceless fricative lateral *ś* corresponds to sibilants in the other Semitic languages (excluding Hebrew, for the moment): Mehri, Jibbāli (formerly called Śḥeri), Ḥarsūsi, Soqoṭri *ś*, Epigraphic South Arabian *s²* (*ś*) = Akkadian *š*, Ugaritic *š*, Aramaic *s*, Arabic *š*, Geez (Classical Ethiopic) *š*. In Hebrew, however, a special character, adapted from šin (ש) and transliterated as *ś* (שׂ), appears in words whose cognates in the South Arabian languages contain fricative laterals (cf. Moscati 1964:33—34, §8.29). The evidence of Hebrew, coupled with that of the South Arabian languages, makes it seem likely that Proto-Semitic contained the voiceless lateralized affricate **t͡ɬ* (cf. Martinet 1975[1953]:253). Cantineau (1952:84—87), Kogan (2011a:71—80), and Steiner (1977:155—156), however, would rather posit a voiceless fricative lateral **ɬ* for Proto-Semitic. R. Stempel (1999:60) notes that either **ɬ* or **t͡ɬ* can be reconstructed. I prefer lateralized affricates to fricative laterals because the former provide a better basis for comparison with cognates in other Afrasian languages.

The original pronunciation of the Arabic sound transliterated as *ḍ* (ض) can be determined by the testimony of the native grammarians (cf. Cantineau 1952:84; Steiner 1977:57—67) and from the evidence of loanwords in other languages (cf. Steiner 1977:68—91). In all probability, this sound was originally a voiced emphatic fricative lateral (cf. Cantineau 1952:84; Steiner 1977:64—65). This sound can be derived from either an earlier glottalized lateralized affricate **t͡ɬ’* (cf. Cantineau 1952:84—86, who writes **ṯˈ₂*; D. Cohen 1968:1304—1305, who writes **tl’*; Martinet 1975[1953]:253, who writes **tl’*; R. Stempel 1999:60) or an earlier glottalized fricative lateral **ɬ’* (cf. Steiner 1977:155—156; Kogan 2011a:71—80). Either reconstruction can also account for the developments found in the other Semitic daughter languages. In Akkadian, Ugaritic, and Hebrew, Proto-Semitic **t͡ɬ’* has the same reflex as **c’*, namely, *ṣ*. As for the Modern South Arabian languages, it is represented by a lateralized dental emphatic in Soqoṭri, while in Mehri, Ḥarsūsi, and Jibbāli, it is represented by a lateralized interdental fricative emphatic (transcribed *ḏ̣*). In Geez, its reflex is generally transcribed as *ḍ*, though the

traditional pronunciation is identical to that of *ṣ* (cf. Lambdin 1978:4). The Aramaic developments are problematic: in the most ancient texts, Proto-Semitic **t͡ɬ'* is represented by *q*, while, in later texts, it is represented by ʿ. For discussion of this problem and proposed solutions, cf. Cantineau (1952:86) and Steiner (1977:38—41).

Semitic correspondences (cf. Moscati 1964:43—44; Lipiński 1997:129—132; R. Stempel 1999:56—60; Kogan 2011a:55):

Proto-Semitic	*ɬ or *t͡ɬ	*ɬ' or *t͡ɬ'
Akkadian	š	ṣ
Ugaritic	š	ṣ
Hebrew	שׂ /ś/	צ /ṣ/
Aramaic	ס /s/	ע /ʿ/
Arabic	ش /š/	ض /ḍ/
Epigraphic South Arabian	s²	ḍ
Geez / Ethiopic	š	ḍ

According to D. Cohen (1968:1304—1305), voiceless and glottalized lateralized affricates should also be reconstructed for Proto-Afrasian. Diakonoff (1992:6 and 15—21) tentatively reconstructs the fricative lateral **ɬ*, which he writes **ŝ*, and the voiceless and glottalized lateralized affricates **t͡ɬ* and **t͡ɬ'*, which he writes **ĉ* and **ĉ̣*, respectively. Orël—Stolbova (1995:xvi) reconstruct the same set as Diakonoff. Ehret (1995:390—395) reconstructs the voiceless fricative lateral **ɬ*, the voiced lateralized affricate **d͡ɮ*, which he writes **dl*, and the glottalized lateralized affricate **t͡ɬ'*, which he writes **tl'*. Takács (2011a:32—33) reconstructs **ŝ*, **ĉ*, and **ĉ̣* but notes that the evidence for the first two is at present scanty.

Orël—Stolbova (1995:xix) give the following correspondences (their transcription has been changed to conform with the transcription used in this book):

Proto-Afrasian	*ɬ	*t͡ɬ	*t͡ɬ'
Proto-Semitic	*ɬ	*t͡ɬ	*t͡ɬ'
Ancient Egyptian	š 𓊃	š 𓊃	ḏ 𓎛
Proto-Berber	*s	*c	*c̣
Proto-East Cushitic	*s	*s *š	*c'
Proto-Southern Cushitic	*ɬ	*t͡ɬ (?)	*t͡ɬ'
Proto-Chadic	*ɬ	*t͡ɬ	*t͡ɬ'

Note: Ehret (1980:37) reconstructs **ɬ* and **t͡ɬ'*, which he writes **ɬ* and **tl*, for Proto-Southern Cushitic.

Ehret (1995:394) gives the following correspondences (as in the preceding table, Ehret's transcription has been changed):

Proto-Afrasian	*ɬ	*d͡ɮ	*t͡ɬ’
Proto-Semitic	*ɬ	*d͡ɮ	*t͡ɬ’
Ancient Egyptian	š 𓊃	d̲ 𓈙	t̲ 𓏏
Proto-Cushitic	*ɬ	*d͡ɮ	*t͡ɬ’
Proto-Chadic	*ɬ	*d͡ɮ	*t͡ɬ’
Proto-Omotic	*l	*ɗ	*ɗ

7.9. GUTTURALS

Proto-Semitic had only a single guttural series, namely, the velars **k*, **g*, and **k’* (sometimes transcribed **q*, sometimes **ḳ*). In Hebrew and Aramaic, /k/ and /g/ have the non-phonemic allophones /χ/ and /ɣ/, respectively (cf. Moscati 1964:26—27, §8.10; O’Leary 1923:52). Proto-Semitic **g* has become *ǧ* [d͡ž] (sometimes transcribed *j*) in Classical Arabic (cf. Moscati 1964:38, §8.42; Lipiński 1997:138) — this is a context-free development and is considered the standard pronunciation, though *g* is retained unchanged in some Arabic dialects (cf. Martinet 1975 [1959]:243—245; Moscati 1964:38, §8.42). Secondary palatalization of the velars is a common innovation in modern Arabic dialects, in modern South Arabian languages, and in Ethiopian Semitic (cf. Lipiński 1997:138—139). In the Semitic languages of Ethiopia, a series of labiovelars has developed alongside the plain velars (cf. Moscati 1964:38, §8.43; Lipiński 1997:139). The labiovelars are a secondary development and do not go back to Proto-Semitic. There are several other notable secondary developments for this series (cf. Lipiński 1997:137—140, Moscati 1964:37—38, and O’Leary 1923:49—53 for details).

Semitic correspondences (cf. Moscati 1964:44; Gray 1934:10; Lipiński 1997: 137—140; R. Stempel 1999:44; Kogan 2011a:55):

Proto-Semitic	*k	*g	*k’
Akkadian	k	g	ḳ
Ugaritic	k	g	ḳ
Hebrew	כ /k/	ג /g/	ק /ḳ/
Aramaic	כ /k/	ג /g/	ק /ḳ/
Arabic	ك /k/	ج /ǧ/	ق /ḳ/
Epigraphic South Arabian	k	g	ḳ
Geez / Ethiopic	k	g	ḳ

A series of velar stops should also be reconstructed for Proto-Afrasian (cf. M. Cohen 1947:111—128; Diakonoff 1992:6 and 22—25; Ehret 1995:174—178; Orël—Stolbova 1995:xvi). Both secondary palatalization of the velars as well as a

tendency toward fricative pronunciation are widespread developments in the Afrasian daughter languages.

Afrasian correspondences (cf. Ehret 1995:174—178; Orël—Stolbova 1995: xvii—xix; Takács 2011a:98):

Proto-Afrasian	*k	*g	*k’
Proto-Semitic	*k	*g	*k’
Ancient Egyptian	k 𓎡	g 𓎛	q 𓐍
Proto-Berber	*γ *-ḵḵ-	*g	*ḳ
Proto-East Cushitic	*k	*g	*k’
Proto-Southern Cushitic	*k	*g	*k’
Proto-Chadic	*k	*g	*k’

In some cases, sibilants in the Semitic languages correspond to affricates in Egyptian and to gutturals in the Cushitic languages (cf. Vergote 1971:44), a good example being:

> Semitic: Arabic *ṣubāʿ*, *ʔiṣbaʿ* ‘finger, toe’; Sabaean *ʔṣbʿ* ‘finger’; Ugaritic (pl.) *uṣbʿt* ‘fingers’; Hebrew *ʔeṣbaʿ* [אֶצְבַּע] ‘finger, toe’; Imperial Aramaic (sg. abs.) *ṣbʿ* ‘finger’, (pl. abs.) *ʔṣbʿn* ‘fingers’; Aramaic *ṣiβʿā* ‘finger, toe’; Geez / Ethiopic *ʔaṣbāʿ(ə)t* [**አጽባዕት**] ‘finger, toe’; Tigrinya *ʔaṣabəʿ* ‘finger, toe’;
>
> = Egyptian *ḏbʿ* ‘finger’; Coptic *tēēbe* [ⲧⲏⲏⲃⲉ] ‘finger, digit’;
>
> = Berber: Tamazight *aḍaḍ* ‘finger’; Siwa *ḍaḍ* ‘finger’; Ghadames *ḍaḍ*, *ṭaḍ* ‘finger’; Mzab *ḍaḍ* ‘finger’; Tuareg *aḍaḍ* ‘finger’; Kabyle *aḍaḍ* ‘finger’;
>
> = Cushitic: Proto-East Cushitic **k’ub-* ‘finger’ > Sidamo (pl.) *k’ubbe* ‘fingers’; Hadiyya *k’ubaʔa* ‘ring, finger-ring’; Yaaku *qop-e* ‘finger’.

Examples such as this can be accounted for by reconstructing a series of palatalized velars for Proto-North Erythraean, which Ehret (1995:489—490) sets up as the ancestor of Proto-Chadic, Proto-Semitic, Pre-Egyptian, and Proto-Berber. The palatalized velars arose through the palatalization of plain velars before **i* and **u*: **ki*/**ku*, **gi*/**gu*, **k’i*/**k’u* > **kʸ*, **gʸ*, **k’ʸ*. In Proto-Semitic, this series developed into dental affricates: **kʸ*, **gʸ*, **k’ʸ* > **cʸ*, **ʒʸ*, **c’ʸ* > **c*, **ʒ*, **c’*. These newly-formed dental affricates then merged completely with the previously-existing dental affricates, and the subsequent development of these two series was identical. In Egyptian, on the other hand, the palatalized velars merged with the palatalized alveolars: **kʸ*, **gʸ*, **k’ʸ* > **tʸ*, **dʸ*, **t’ʸ* > *t̲*, *d̲*, *d̲* (cf. Loprieno 1997:435). The Chadic developments are uncertain. However, Newman (1977:9 and 11) reconstructs a series of palatalized velars for Proto-Chadic, which he writes **kʸ* and **gʸ* (Newman does not reconstruct a glottalized member). If these sounds are not due to secondary developments within Chadic itself, it may be that the original palatalized velars of Proto-North Erythraean were preserved in Proto-Chadic.

Afrasian correspondences:

Proto-Afrasian	*ki/*ku	*gi/*gu	*k'i/*k'u
Proto-Semitic	*c	*ʒ	*c'
Ancient Egyptian	t̲	d̲	d̲
Proto-Berber	*t (?)	*d (?)	*ṭ (?)
Proto-East Cushitic	*k	*g	*k'
Proto-Southern Cushitic	*k	*g	*k'
Proto-Chadic	*kʸ (?)	*gʸ (?)	*k'ʸ (?)

In addition to the correspondences that make it seem likely that Proto-Afrasian had a series of plain velars, there are still other correspondences that point to the existence of a series of labiovelars in Proto-Afrasian (cf. D. Cohen 1968:1303; M. Cohen 1947:129—130; Diakonoff 1988:34 and 1992:6, 22—29; Ehret 1995:174—178): *k^w, *g^w, and *k'^w. Although the labiovelars were lost in the Semitic branch, having merged with the plain velars, their former presence can be ascertained by the fact that, in primary nominal stems, they, along with the bilabials, caused a following earlier *ə to be raised, backed, and rounded to *u (cf. Diakonoff 1970:456 and 464, 1975:135 and 141): *k^wə, *g^wə, *k'^wə > *ku, *gu, *k'u. The labiovelars were preserved in Proto-Southern Cushitic (cf. Ehret 1980:23—36) and Proto-Chadic (cf. Newman 1977:11).

Afrasian correspondences:

Proto-Afrasian	*kʷ	*gʷ	*k'ʷ
Proto-Semitic	*k	*g	*k'
Ancient Egyptian	k	g	q
Proto-Berber	*k	*g	*ḳ
Proto-East Cushitic	*k	*g	*k'
Proto-Southern Cushitic	*kʷ	*gʷ	*k'ʷ
Proto-Chadic	*kʷ	*gʷ	*k'ʷ

Proto-Afrasian may also have had a series of postvelars (*q, *ɢ, *q').

7.10. GLIDES AND LIQUIDS

There can be no question that Proto-Semitic had *w, *y, *l, and *r. The liquids are well preserved in the Semitic daughter languages, but the glides are subject to various modifications: In later Akkadian, the glides were lost initially (cf. Moscati 1964:45—46, §8.63; O'Leary 1923:66—67), while in Ugaritic, Hebrew, and Aramaic, initial *w mostly became y (cf. Gray 1934:19, §27; Moscati 1964:46,

§8.64; O'Leary 1923:65—67) — such a development also occurs sporadically in ancient South Arabian dialects.

Semitic correspondences (cf. Kogan 2011a:55):

Proto-Semitic	*w	*y	*l	*r
Akkadian	Ø	y Ø	l	r
Ugaritic	w y	y	l	r
Hebrew	ו /w/ י /y/	י /y/	ל /l/	ר /r/
Aramaic	ו /w/ י /y/	י /y/	ל /l/	ר /r/
Arabic	و /w/	ى /y/	ل /l/	ر /r/
Epigraphic South Arabian	w y	y	l	r
Geez / Ethiopic	w	y	l	r

The glides **w* and **y* and the liquids **l* and **r* are also to be reconstructed for Proto-Afrasian (cf. Diakonoff 1992:6 and 32—35; Ehret 1995:390—395 and 452; Orël—Stolbova 1995:xx).

The Ancient Egyptian developments require special comment. Egyptian did not have separate signs for /l/. There can be no doubt, however, that /l/ existed as an independent phonemic entity since it occurs as such in the later Coptic. In Egyptian, /l/ was written with the signs <n>, <r>, <ꜣ>, and <ỉ> (< **li-*, **lu-* [cf. Diakonoff 1974:595]) (cf. Loprieno 1995:33, note c; Peust 1999:127—132; Vergote 1973.Ib: 26). **r* became <ꜣ> in Egyptian when it occurred at the end of an accented syllable before a following consonant or before pause. Similar developments can be observed for *t*, *d*, and *n*. In some instances, *y* represents either an earlier glottal stop or an earlier *w*.

Newman (1977) does not reconstruct **l* for Proto-Chadic, but the evidence presented by Jungraithmayr—Shimuzu (1981) and Jungraithmayr—Ibriszimow (1994) make it clear that **l* must have existed. Both Ehret (1995:393—394) and Orël—Stolbova (1995:xx) reconstruct **l* for Proto-Chadic.

Afrasian correspondences (cf. Ehret 1995:390—395 and 452; Orël—Stolbova 1995:xx; Diakonoff 1965:27—28):

Proto-Afrasian	*w	*y	*l	*r
Proto-Semitic	*w	*y	*l	*r
Ancient Egyptian	w	ỉ y	n r ꜣ ỉ	r ꜣ
Proto-Berber	*w	*y	*l	*r
Proto-East Cushitic	*w	*y	*l	*r
Proto-Southern Cushitic	*w	*y	*l	*r
Proto-Chadic	*w	*y	*l	*r

7.11. GLOTTAL STOP AND GLOTTAL, VELAR, AND PHARYNGEAL FRICATIVES

Proto-Semitic is usually assumed to have had a glottal stop, a glottal fricative, voiceless and voiced pharyngeal fricatives, and voiceless and voiced velar fricatives: **ʔ*, **h*, **ḥ*, **ʕ*, **x*, **γ* (traditionally written **ʾ*, **h*, **ḥ*, **ʿ*, **ḫ*, **ġ*, respectively). In Akkadian, **ʔ*, **h*, **ḥ*, **ʕ*, and **γ* (but not **x* [traditional **ḫ*]) merged into ʾ /ʔ/ initially. The former presence of **ḥ* and **ʕ* and sometimes of **γ* and **h* as well can be determined by the fact that they changed a contiguous *a* to *e* (cf. Moscati 1964:38—39, §8.45, and 41—42, §8.54). These same sounds were completely lost medially between a preceding vowel and a following non-syllabic in Akkadian. This change caused the vowel to be lengthened (the following examples are from Couvreur 1937:288—289):

1. Akkadian **raʔšu* > *rāšu* (later *rēšu*) ‘head’; Hebrew *rōʔš* [רֹאשׁ] ‘head’; Aramaic *rēšā* ‘head’; Phoenician *rʔš* ‘head’; Arabic *raʔs* ‘head’; Epigraphic South Arabian *rʔs* ‘head’; Śḥeri / Jibbāli *réš*/*réš* ‘head’; Soqoṭri *riy* ‘head’; Ugaritic *riš* ‘head’; Geez / Ethiopic *rəʔəs* ‘head’ [ርእስ]; Tigrinya *rəʔsi* ‘head’; Tigre *räʔas* ‘head’; Amharic *ras* ‘head’. Cf. Militarëv 2011:75, no. 38.
2. Akkadian **raḥmu* > **reḥmu* > **reʔmu* > *rēmu* ‘grace, mercy’; Hebrew *raḥūm* [רַחוּם] ‘compassionate’; Arabic *raḥima* ‘to have mercy, compassion’, *raḥma* ‘pity, compassion’; Śḥeri / Jibbāli *raḥám* ‘to be kind’; Mehri *rəḥām* ‘to be kind to someone’; Ḥarsūsi *reḥam* ‘to pity’; Ugaritic *rḥm* ‘to be kind’; Tigre *räḥama* ‘to have pity on’ (Arabic loan).
3. Akkadian **baʿlu* > **beʿlu* > **beʔlu* > *bēlu* ‘owner, lord’; Hebrew *baʿal* [בַּעַל] ‘lord, owner’; Ugaritic *bʿl* ‘owner of the house’; Arabic *baʿl* ‘husband, master, owner’; Epigraphic South Arabian *bʿl* ‘master, owner’; Ḥarsūsi *bāl* ‘master, lord’; Mehri *bāl* ‘owner, possessor’; Śḥeri / Jibbāli *báʿal* ‘person owning’; Soqoṭri *baʿl* ‘master, lord’; Geez / Ethiopic *baʿāl* [በዓል] ‘owner, master’; Tigre *bäʿal* ‘master’; Tigrinya *bäʿal*, *baʿal* ‘master’; Amharic *bal* ‘master’.

A similar phenomenon occurs in Classical Arabic, where, according to the native grammarians, as well as in the traditional reading of the Qur’ān, ʾ is weakened and even lost with compensatory vowel lengthening when the loss takes place between a preceding short vowel and a following consonant (cf. Cantineau 1960:79—80). Likewise in modern Arabic dialects, where original ʾ is often replaced by *w*, *y*, or by compensatory vowel lengthening (cf. Kaye—Rosenhouse 1997:277).

In Hebrew and Aramaic, **ʕ* and **γ* have merged into ʿ /ʕ/, and **ḥ* and **x* have merged into *ḥ* /ħ/ (cf. Lipiński 1997:145—146; Moscati 1964:40, §8.49; R. Stempel 1999:62—63; Rendsburg 1997:74).

In the Semitic languages of Ethiopia, **ʕ* and **γ* have merged into ʿ /ʕ/, and the same change can be observed in Soqoṭri and several modern Arabic dialects (cf. Lipiński 1997:147—148). In Tigre and Tigrinya, *ḥ* and *ḫ* have merged into *ḥ*, while all of the earlier laryngeal and pharyngeal fricatives tend to be lost in South

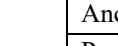
Ethiopic. On the other hand, *ʔ*, *h*, and *ḥ* are preserved in Harari, Argobba, and several dialects of Gurage under certain conditions (cf. Lipiński 1997:148).

Semitic correspondences (cf. Moscati 1964:44—45; Lipiński 1997:141—150; R. Stempel 1999:60—63; Gray 1934:10 and 19; Buccellati 1997b:18):

Proto-Semitic	*ʔ	*h	*ḥ	*ʕ	*x	*γ
Akkadian	ʾ Ø	ʾ Ø	ʾ Ø	ʾ Ø	ḫ	ʾ Ø
Ugaritic	ả ỉ ủ	h	ḥ	ʿ	ḫ	ġ
Hebrew	א /ʔ/	ה /h/	ח /ḥ/	ע /ʿ/	ח /ḫ/	ע /ʿ/
Aramaic	א /ʔ/	ה /h/	ח /ḥ/	ע /ʿ/	ח /ḫ/	ע /ʿ/
Arabic	ا /ʔ/	ه /h/	ح /ḥ/	ع /ʿ/	خ /ḫ/	غ /ġ/
Epigraphic South Arabian	ʾ	h	ḥ	ʿ	ḫ	ġ
Geez / Ethiopic	ʾ	h	ḥ	ʿ	ḫ	ʿ

Opinions differ as to how many of these sounds are to be reconstructed for Proto-Afrasian. Indeed, the correspondences adduced to support the reconstruction of voiceless and voiced velar fricatives in Proto-Afrasian are controversial, and in some cases, it can be shown that secondary developments have led to the appearance of these sounds in the daughter languages. Moreover, some examples of voiceless and voiced velar fricatives are considered by some specialists to be reflexes of earlier postvelars. Finally, there is some confusion among the reflexes found in the daughter languages. Nonetheless, it seems that **ʔ*, **h*, **ḥ*, **ʕ* , **x*, **γ* need to be reconstructed for Proto-Afrasian. Labialized varieties of these sounds may also have existed (cf. Diakonoff 1975:142). These sounds were generally preserved in the earlier stages of the Afrasian daughter languages, the main exceptions being Berber, where they seem to have been mostly lost, and Chadic, where they were partially lost. In the course of its history, Egyptian also reduced and/or modified these sounds, similar to what is found in several modern Semitic languages (cf. Vergote 1973.Ib:28; Loprieno 1995:41—46; Greenberg 1969). For discussion, correspondences, and examples, cf. Diakonoff 1992:25—29 (for the velar fricatives) and 29—32 (for **ʔ*, **h*, **ḥ*, **ʕ*); Ehret 1995:174—178 (for the velar fricatives) and 338—340 (for **ʔ*, **h*, **ḥ*, **ʕ*); Orël—Stolbova 1995:xx (Orël—Stolbova reconstruct **ʔ*, **h*, **ḥ*, **ʕ*, **x*, **γ*, **q*, and **q'* for Proto-Afrasian).

Afrasian correspondences (cf. Takács 2011a:98):

Proto-Afrasian	*ʔ	*h	*ḥ	*ʕ	*x	*γ
Proto-Semitic	*ʔ	*h	*ḥ	*ʕ	*x	*γ
Ancient Egyptian						
Proto-Berber	Ø	*h	*h	*h	*γ	*h
Proto-East Cushitic	*ʔ	*h	*ḥ	*ʕ	*ḥ	*ʕ
Proto-Southern Cushitic	*ʔ	*h	*ḥ	*ʕ	*x	
Proto-Chadic		*h	*h			

Note: The Berber reflexes are based upon Takács 2011a.

7.12. VOWELS

Six vowels are traditionally reconstructed for Proto-Semitic (cf. Bergsträsser 1928:5 and 1983:5; Kogan 2005 and 2011a:119—124; Lipiński 1997:152—165; Moscati 1964:46, §8.66; O'Leary 1923:91—119; Brockelmann 1908—1913.I:44, 141—151, and 1916:54, 67—70; R. Stempel 1999:31—4):

i	u	ī	ū
a		ā	

Proto-Semitic is also assumed to have had sequences of **a* plus **y* and **a* plus **w* (cf. Moscati 1964:54, §8.97). The oldest Egyptian (cf. Callender 1975:8—9; Gardiner 1957:428—433; Loprieno 1995:35 and 1997:440; Vergote 1973.Ib:39) and Common Berber (cf. Prasse 1975:223) probably had vowel systems identical to that traditionally posited for Proto-Semitic, though modern Berber languages are quite diverse in their vowel systems (cf. Kossmann 2012:28—33). Ancient Egyptian may have had a schwa-like vowel (ə) as well. As noted by Ehret (1995:55 — details are given on pp. 60—66), Semitic, Berber, Egyptian, and Chadic have substantially reduced the vowel system inherited from Proto-Afrasian.

The problems of vocalic patterning — within the larger context of root structure patterning in Proto-Semitic — have been thoroughly investigated by Diakonoff (1970:453—480, 1975:133—151, and 1992:65—97). According to Diakonoff, in non-derivative nominal stems, the vocalic patterning differs from that posited for Proto-Semitic as a whole:

1. There were no original long vowels in non-derivative nominal stems in Proto-Semitic.
2. The vowel **u* seems to be in allophonic alternation with the vowel **i* in non-derivative nominal stems in Proto-Semitic, being found mainly before or after the bilabials **p*, **b*, and **m*, after the gutturals **k*, **g*, and **k'* (when from earlier **k^{w}*, **g^{w}*, and **k'^{w}*), and occasionally also after the glottal stop **ʔ* (perhaps from earlier **ʔ^{w}* ?). This point leads Diakonoff to suggest that **i* and **u* are to be derived from an earlier common vocalic entity, which he writes **ə*. Diakonoff also notes that unstressed **a* could appear as either **a* or **i* in the Semitic daughter languages.
3. If a non-derivative nominal stem has the shape **$C_1VC_2C_3$*, then either C_2 or C_3 is **ʔ*, **w*, **y*, **m*, **n*, **l*, **r*. If it is **C_2* that is one of these phonemes, then the vowel is **a*. This leads Diakonoff to posit syllabic resonants similar to those reconstructed for Proto-Indo-European and Proto-Kartvelian. This view is particularly controversial and is not widely accepted — it is rejected by Ehret (1995:16), for example.

Diakonoff then continues by discussing the ramifications of his theories, including the patterning in verbal stems. See also Kogan 2005.

According to Sasse (1979:5), Proto-East Cushitic had the following ten vowels:

i			u			ī			ū
	e		o				ē		ō
		a						ā	

Ehret (1980:38) reconstructs fourteen vowels for Proto-Southern Cushitic. Ehret notes, however, that this system may have developed from an earlier six vowel system similar to that traditionally reconstructed for Proto-Semitic.

i		ɨ		u		ī		ɨ̄	ū
	e		ʌ	o			ē		ō
		a						ā	

Newman (1977:11) assumes that Proto-Chadic had, at most, four phonemic vowels:

i				u
		ə		
		a		

On the basis of a comparison of the vowel systems reconstructed for the various Afrasian daughter languages, it would appear that a vowel system identical to that traditionally posited for Proto-Semitic is to be posited for Proto-Afrasian as well, at least for the period of development existing immediately prior to the emergence of the individual Afrasian daughter languages. Such a reconstruction has indeed been proposed by a number of scholars. However, when the vocalic patterning is subjected to careful analysis, it becomes clear that a reconstruction modeled after that of Proto-Semitic does not represent the original state.

In a series of articles published in *Вопросы Языкознания* (*Voprosy Jazykoznanija*) in 1988 and 1990, respectively, Vladimir Orël and Olga Stolbova analyzed vowel correspondences in non-derivative nominal stems in West Chadic, Semitic, and Proto-Coptic. They also noted that the original vocalism of verbs is represented by West Chadic and Arabic imperfectives. Their analysis led them to reconstruct six vowels for Proto-Afrasian: **a*, **e*, **i*, **o*, **u*, and **ü*. Orël—Stolbova base their reconstruction upon the following correspondences:

Proto-Afrasian	*a	*e	*i	*o	*u	*ü
Proto-Semitic	*a	*i	*i	*u	*u *a	*i
Proto-West Chadic	*a	*ya	*i	*wa	*u	*u
Proto-Coptic	*a *o	*e	*e *i	*e	*u *o	*i

This reconstruction is repeated by Orël—Stolbova in their comparative dictionary (cf. Orël—Stolbova 1995:xxi—xxiv).

Ehret (1995:61) reconstructs four vowels for Pre-Proto-Semitic: **a*, **ə*, **i*, and **u*, which later collapsed into **a* ~ **ə* in Proto-Semitic proper. This is essentially the position taken by Diakonoff. Ehret claims that long vowels are not required at the Proto-Semitic level and that the long vowels found in the Semitic daughter languages are due to developments specific to each language. He sees the Proto-Semitic system as due to an innovation in which an earlier, more complicated system has been substantially reduced. Ehret also accepts Newman's (1977:11) view that Proto-Chadic had a four-vowel system: **a*, **ə*, **i*, and **u*. Ehret (1995:55—67) reconstructs a system of ten vowels — five long and five short — for Proto-Afrasian: **a*, **aa*, **e*, **ee*, **i*, **ii*, **o*, **oo*, **u*, **uu*. It may be noted here that the system proposed by Ehret is more natural from a typological perspective than that proposed by Orël—Stolbova. Ehret (1995:67) bases his reconstruction upon the following correspondences:

Proto-	*a	*aa	*e	*ee	*i	*ii	*o	*oo	*u	*uu
Proto-Semitic	*a	*a	*a	*ə	*ə	*ə	*a	*ə	*ə	*ə
Pre-Egyptian	*a	*a	*a	*i	*i	*i	*a	*i	*i	*u
Proto-Cushitic	*a	*aa	*e	*ee	*i	*ii	*o	*oo	*u	*uu
Proto-North Omotic	*a	*a:	*e *i	*e:	*e *i	*i:	*o *u	*o:	*o *u	*u:
Proto-Chadic	*a	*a	*a	*ə	*ə	*i	*a	*ə	*ə	*u

Though it is Ehret's views on the vowels that are followed in this book (for both Proto-Semitic and Proto-Afrasian), it must be cautioned that much work still needs to be done here.

The Pre-Proto-Afrasian vowel system may be reconstructed as follows:

Vowels: i (~ e) u (~ o)
e o
(ə ~) a

Also the sequences: iy (~ ey) uy (~ oy) ey oy (əy ~) ay
iw (~ ew) uw (~ ow) ew ow (əw ~) aw

This is identical to the vowel systems reconstructed for Pre-Proto-Indo-European and Pre-Proto-Kartvelian. In Proto-Afrasian, **ə* was rephonemicized as **i* or **u*, depending upon the environment, and long vowels came into being.

The Proto-Afrasian vowels were subject to ablaut alternations that cannot be precisely defined at the present time.

7.13. ROOT STRUCTURE PATTERNING IN AFRASIAN

There has been much discussion, some of it rather heated, concerning root structure patterning within Afrasian. Until fairly recently, there was strong resistance to look objectively at the data from all of the branches of the Afrasian language family, far too much emphasis being placed on the importance of the Semitic branch alone, which was often uncritically taken to represent the original state of affairs.

In the Semitic branch, the vast majority of roots are triconsonantal. It is certain, however, that at one time there were more biconsonantal roots and that the triconsonantal system has been greatly expanded in Semitic at the expense of roots with other than three consonants (cf. Moscati 1964:72—75; Ullendorf 1958:69—72; Militarëv 2005). In particular, we may note Diakonoff's (1984:1—2) comments on Afrasian root structure patterning:

> The latest argument which has recently been advanced in favour of retaining the term 'Hamitic' was, as far as I know, the supposed fact that the Hamitic roots are mainly biconsonantal while those of Semitic are triconsonantal. Our work on the Comparative Historical Vocabulary of Afrasian (CHVA) has shown without a shadow of doubt that this is wrong. The Common Afrasian roots were in principle biconsonantal; most of them have been extended to a triconsonantal status either by reduplicating the second consonant of the root or by adding a real or fictitious 'weak' consonant (forming either *mediae infirmae* or *tertiae infirmae* roots); the choice between the formation of a *secundae geminatae*, a *mediae infirmae* or a *tertiae infirmae* secondary stem is virtually non-predictable (i.e. these types of the root are allomorphic at the Proto-Afrasian level). An additional method of forming secondary roots is the one well known from Proto-Indo-European, viz., the adding of a suffixed (very rarely prefixed) consonant 'complement' to the root. In about 90% of the cases (at least in that part of the vocabulary which we have worked through) the so-called 'three-consonantal roots' can with a great certainty be derived from well attested biconsonantal roots plus a complement which is used to modify the main semantics of the biconsonantal roots. Note that the 'biconsonantal cum complement' roots are well attested not only in Semitic but also in Cushitic, Berber and Egyptian, and though they are somewhat more rare in Chadic and some of the Cushitic languages, the reason for this phenomenon is: (1) the loss of external inflection which later also caused losses in the final stem consonants and (2) the loss of a number of Proto-Semitic phonemes in Late Stage languages.

In an article published in 1989, Christopher Ehret closes the case. Through careful analysis, fully supported by well-chosen examples from Arabic, Ehret demonstrates that the third consonantal elements of Semitic triconsonantal roots were originally suffixes, which, in the majority of cases examined by him, had served as verb extensions. In particular, he identifies and categorizes thirty-seven such extensions. In subsequent works (1995:15—54, 2003a, 2003b, and 2008a), Ehret expands his investigation to encompass other branches of Afrasian. He concludes (1995:15):

> The laying out of the comparative Afroasiatic data, undertaken in Chapter 5, shows that just two fundamental stem shapes can be reconstructed for proto-Afroasiatic, CVC and C(V), the latter having the possible alternative shape VC in verb roots. To the stem could be added any of a number of nominalizing suffixes of the form -(V)C- or any of a great variety of verb extensions of the shape -(V)C-. The evidence makes it probable that the underlying form of such suffixes was usually -C-, with the surfacing of a preceding vowel depending on, and its particular realization in different Afroasiatic subgroups predictable from, the syllable structure rules of the particular groups. (The particular outcomes of such processes will not be further argued here, but will be left to future studies.) Afroasiatic roots containing such suffixes are therefore given in Chapter 5 in the form *$C_1VC_2C_S$-, where C_S represents the suffix. Two exceptions would have been the nominal suffixes *w and *y, which probably did have fixed vowel accompaniments and -VC shapes…

Thus, the Proto-Afrasian root may be assumed to have had two forms, either **CV*- or **CVC*-. As in Pre-Proto-Indo-European, **CVC*- could be extended by means of a suffix to form an inflectional stem: **CVC-(V)C*-. Originally, these suffixes appear to have been utilized primarily as verb extensions. Depending upon when they became separated from the rest of the Afrasian speech community, each branch exploited to a different degree the patterning that was just beginning to develop in the Afrasian parent language, with Semitic carrying it to the farthest extreme.

It thus emerges that the rules governing the structural patterning of roots and stems in the earliest stage of Proto-Afrasian (cf. Diakonoff 1988:42—56) are remarkably similar to what is posited for the earliest stage of Proto-Indo-European:

1. There were no initial vowels in the earliest form of Proto-Afrasian. Therefore, every root began with a consonant. (It may be noted that Ehret [1995] assumes that roots could begin with vowels in Proto-Afrasian.)
2. Originally, there were no initial consonant clusters either. Consequently, every root began with one and only one consonant. There must also have been restrictions on permissible medial and final consonant clusters.
3. Two basic syllable types existed: (A) **CV* and (B) **CVC*, where *C* = any consonant and *V* = any vowel. Permissible root forms coincided with these two syllable types.
4. A verb stem could either be identical with a root or it could consist of a root plus a single derivational morpheme added as a suffix to the root: **CVC-(V)C*-. Any consonant could serve as a suffix.
5. Primary (that is, non-derivational) noun stems displayed similar patterning, though, unlike verb stems, they were originally characterized by stable vocalism.

There were three fundamental stem types in Proto-Afrasian: (A) verb stems, (B) noun and adjective stems, and (C) pronoun and indeclinable stems. Pronoun and indeclinable stems could end in a vowel. Verb stems had to end in a consonant (it

may be noted that this is the stem patterning posited by Ehret [1980:45—47] for Proto-Southern Cushitic), while, at least according to Ehret (1995:15), noun and adjective stems were distinguished by an additional element, the so-called "terminal vowel":

> The Omotic, Cushitic, and Chadic evidence conjoin in requiring the existence in PAA of an additional element in word formation, a terminal vowel (TV) in nouns and modifiers, the original function and meaning of which remain obscure. TVs have been subjected to comparative-historical investigation in only two groups of Afroasiatic languages. In Omotic they have no reconstructible function beyond their necessary attachment to singular noun stems in semantically predictable fashion. With the exception of Kafa, in which two TVs, *-o* and *-e*, have been grammaticalized respectively as masculine and feminine markers, they carry no grammatical or recognizable semantic load (Hayward 1987). In proto-Southern Cushitic, pairs of TVs formed a variety of singular-plural markers. Particular paired sets tended to go with either masculine or feminine nouns, but an individual TV on a singular noun generally gave no indication of the grammatical gender of that noun (Ehret 1980:49—50).
>
> From these indicators it seems reasonable to conclude that TVs are fossils of a nominal morphology productive in pre-proto-Afroasiatic and predating the rise of grammatical gender in the family. Having lost their original grammatical function, they have been reanalyzed as markers of the singular or sometimes, as in the case of Southern Cushitic, of the plural in nominals. In the Boreafrasian subgroup (Semitic, Egyptian, and Berber: see Chapter 6 for this classification), the TVs have generally been dropped entirely, leaving most nouns and adjectives as consonant-final words.
>
> The existence of TVs at early stages of Afroasiatic evolution obviates the need to reconstruct any syllabic consonants for PAA. The usual word structure of nouns and adjectives would have been $*C_1(VC_2)(C_S)V_{tv}$, in which the only possible structures are CVC and CV and never just C. The presence of syllabic C in Boreafrasian languages can be understood as the natural outcome of vowel loss, whether word-internal or word-final, within that particular subgroup (as is also separately the case in a few modern Omotic languages, notably Bench and Maji, where the same kind of sound change has independently been at work).

The consonants carried the basic meaning of the stem in Proto-Semitic, while the vowels were used as internal grammatical morphemes: that is to say, grammatical categorization was partially achieved by means of fixed vocalic patterning, at least in verb stems (for more information, see Chapter 18, §18.2; see also Rubio 2004).

It is thus now certain beyond any reasonable doubt that the third consonantal element of the Proto-Semitic root, be it in initial, medial, or final position, was simply not a part of the root, in the overwhelming majority of cases, at the Proto-Afrasian level and that the underlying basic Proto-Afrasian root structure patterning was biconsonantal (C_1-C_2) (cf. Hecker 2007; Zaborski 1971). The mechanisms used to create new triconsonantal roots in Semitic are discussed by Militarëv (2005).

7.14. PHONOLOGICAL SYSTEMS OF THE INDIVIDUAL BRANCHES

In this section, the phonological systems reconstructed for the proto-languages of the individual branches will be presented, beginning with Semitic.

SEMITIC: The reconstruction of the Proto-Semitic phonological system has been discussed in detail in the preceding sections of this chapter. It may be summarized as follows (cf. Bergsträsser 1928:4; Bomhard 1988b; Brockelmann 1908—1913.I: 41—44 and 1916:53—54; Cantineau 1952; Gray 1934:8; Huehnergard 2004:142; Kogan 2011a:54; Moscati 1964:24; Rubin 2010:23; R. Stempel 1999:68):

	Labial	Palatalized	Dental	Velar	Glottal	Pharyngeal
Stops	p b	tʸ dʸ t'ʸ	t d t'	k g k'	ʔ	
Affricates			c ʒ c'			
Fricatives		 sʸ	s z s'	x ɣ	h	ħ ʕ
Lateralized			ɬ or t͡ɬ l ɬ' or t͡ɬ'			
Nasals	m		n			
Glides	w	y				
Tap/Trill			r			

Notes:
1. The palatalized-alveolars are often reconstructed as interdentals, which are written with an underscore: *$\underline{t}$ (= *t^{y}), *$\underline{d}$ (= *d^{y}), *$\underline{t}'$ (= t'^{y}).
2. The emphatics are commonly written with an underdot: *$\underline{t}'$ (= *t'^{y}), *$ṭ$ (= *t'), *$ḳ$ (= *k'), while *k' is sometimes written *q.
3. *s^{y} is usually written *$š$.
4. The glottal stop, the glottal fricative, the voiceless and voiced velar fricatives, and the voiceless and voiced pharyngeal fricatives are usually written as follows: *$'$ (= *$ʔ$), *h (= *h), *$ḫ$ (= *x), *$ġ$ (= *γ), *$ḥ$ (= *$ħ$), *$'$ (= *$ʕ$).
5. The voiceless fricative lateral is usually written *$ś$ (= *$ɬ$), while its emphatic counterpart is usually written *$\underline{ḍ}$ (= *$ɬ'$), sometimes also *$ḍ$. In Russian works, *$ŝ$ = *$ɬ$, *$ŝ'$ = *$ɬ'$, *$ĉ$ = *$\underset{\smile}{tɬ}$, and *$ĉ'$ = *$\underset{\smile}{tɬ}'$.

The Hebrew, Aramaic, and Arabic scripts and their standard transliterations are included in the tables of sound correspondences in the preceding sections and will

not be repeated here. The Ethiopian script was not included in those tables — it is as follows (cf. Lambdin 1978:8—9; Dillmann 1907:34—113; Daniels 1997b:39):

	Ca	Cū	Cī	Cā	Cē	C, Cə	Cō		Ca	Cū	Cī	Cā	Cē	C, Cə	Cō
h	ሀ	ሁ	ሂ	ሃ	ሄ	ህ	ሆ	ʕ	ዐ	ዑ	ዒ	ዓ	ዔ	ዕ	ዖ
l	ለ	ሉ	ሊ	ላ	ሌ	ል	ሎ	z	ዘ	ዙ	ዚ	ዛ	ዜ	ዝ	ዞ
ḥ	ሐ	ሑ	ሒ	ሓ	ሔ	ሕ	ሖ	y	የ	ዩ	ዪ	ያ	ዬ	ይ	ዮ
m	መ	ሙ	ሚ	ማ	ሜ	ም	ሞ	d	ደ	ዱ	ዲ	ዳ	ዴ	ድ	ዶ
š	ሠ	ሡ	ሢ	ሣ	ሤ	ሥ	ሦ	g	ገ	ጉ	ጊ	ጋ	ጌ	ግ	ጎ
r	ረ	ሩ	ሪ	ራ	ሬ	ር	ሮ	ṭ	ጠ	ጡ	ጢ	ጣ	ጤ	ጥ	ጦ
s	ሰ	ሱ	ሲ	ሳ	ሴ	ስ	ሶ	p	ጰ	ጱ	ጲ	ጳ	ጴ	ጵ	ጶ
ḳ	ቀ	ቁ	ቂ	ቃ	ቄ	ቅ	ቆ	ṣ	ጸ	ጹ	ጺ	ጻ	ጼ	ጽ	ጾ
b	በ	ቡ	ቢ	ባ	ቤ	ብ	ቦ	ḍ	ፀ	ፁ	ፂ	ፃ	ፄ	ፅ	ፆ
t	ተ	ቱ	ቲ	ታ	ቴ	ት	ቶ	f	ፈ	ፉ	ፊ	ፋ	ፌ	ፍ	ፎ
ḫ	ኀ	ኁ	ኂ	ኃ	ኄ	ኅ	ኆ	ṗ	ፐ	ፑ	ፒ	ፓ	ፔ	ፕ	ፖ
n	ነ	ኑ	ኒ	ና	ኔ	ን	ኖ	ḳʷ	ቈ		ቍ	ቋ	ቌ	ቍ	
ʔ	አ	ኡ	ኢ	ኣ	ኤ	እ	ኦ	ḫʷ	ኈ		ኍ	ኋ	ኌ	ኍ	
k	ከ	ኩ	ኪ	ካ	ኬ	ክ	ኮ	kʷ	ኰ		ኵ	ኳ	ኴ	ኵ	
w	ወ	ዉ	ዊ	ዋ	ዌ	ው	ዎ	gʷ	ጐ		ጕ	ጓ	ጔ	ጕ	

EGYPTIAN: Here, I will just give the Egyptian hierogplyphs and their traditional transliteration, without further discussion (cf. J. Allen 2010:14; Gardiner 1957:27; Hannig 1995:XLV—XLVII; Mercer 1961a:4; Peust 1999:48; Loprieno 1995:15):

Hieroglyph	Transliteration	Hierogplyph	Transliteration
	ꜣ		ḫ
	ꜥ		ḥ
	y		z
	ꜥ		s
	w		š
	b		q
	p		k
	f		g
	m		t
	n		ṯ
	r		d
	h		ḏ
	ḥ		

The Coptic alphabet is based upon Greek, with six additional letters borrowed from Demotic. It is as follows (cf. J. Allen 2013:12; Lambdin 1982:x; Loprieno 1995:25; Steindorff 1904:6—7; Till 1978:40):

ⲁ a	ⲏ ē	ⲛ n	ⲧ t	ⲯ š
ⲃ b	ⲑ th	ⲝ ks	ⲩ, ⲟⲩ u	ⲫ f
ⲅ g	ⲓ, ⲉⲓ i	ⲟ o	ⲫ ph	ⲭ h
ⲇ d	ⲕ k	ⲡ p	ⲭ kh	ⲭ ğ
ⲉ e	ⲗ l	ⲣ r	ⲫ ps	ⲱ č
ⲍ z	ⲙ m	ⲥ s	ⲱ ō	ⲧ ti

Semivowels and diphthongs (cf. Lambdin 1982:xii—xiii):

ⲁⲓ, ⲁⲉⲓ	=	ay
ⲁⲩ (rarely ⲁⲟⲩ)	=	aw
ⲉⲓ (less commonly ⲉⲉⲓ)	=	ey
ⲉⲩ (rarely ⲉⲟⲩ)	=	ew
ⲏⲓ	=	ey
ⲏⲩ	=	ew
ⲓⲉⲓ, ⲉⲓⲉⲓ	=	yi
ⲓⲟⲩ (rare)	=	iw
ⲟⲉⲓ, ⲟⲓ	=	oy
ⲟⲟⲩ	=	ow
ⲱⲓ	=	oy
ⲱⲟⲩ	=	ow
ⲟⲩⲓ (rare)	=	uy, perhaps also wi
ⲟⲩⲟⲩ (rare)	=	uw

Kammerzell (1998:38) reconstructs the consonant system of Pre-Old Egyptian (ca. 3000 BCE) as follows:

	cAh	CAH	CaH	caH	cah
Nasals	m	n			
Laterals		l			
Trills		r			
Glides	w		j		
Voiced Obstruents	b	d	g		ɢ [ʁ]
Emphatic Obstruents		tˀ	kˀ		qˀ [χˀ]
Voiceless Obstruents	p	t [t] [ts]	k		q [χ]
Sibilants	ɸ	ʃ			[h]

Note: c = [-coronal]; C = [+coronal]; a = [-anterior]; A = [+anterior]; h = [-high]; H = [+high].

BERBER: The Proto-Berber phonological system has not been reconstructed yet. The Ahaggar Tuareg consonant system may be taken as a representative example (cf. Kossmann 2012:23; Maddieson 1984:314):

	Labial	Dental	Palatal	Velar	Uvular	Pharyngeal
Voiceless Stop		t tt		k kk	 qq	
Voiced Fricative	f ff	s ss	(š) (šš)		(x) (xx)	
Voiced Stop	b bb	d dd	g^y gg^y			
Voiced Fricative		(z) zz	(ž) (žž)		ɣ	
Pharyngealized Voiceless Stop		 ṭṭ				
Pharyngealized Voiced Stop		ḍ				
Pharyngealized Voiceless Fric.		ẓ ẓẓ				
Nasal	m mm	n nn	(ɲ)	 (ŋŋ)		
Glide	w (ww)		y (yy)			h (hh)
Rhotic		r rr				
Liquid		l ll				

The following vowels are found in Ayer Tuareg (cf. Kossmann 2012:28):

i u
ə
ă
e a o

Tashelhiyt / Shilha has a much simpler system (cf. Kossmann 2012:28):

i u
a

Kosmann (2012:28) notes: “Berber languages differ considerably as to their vowel systems. Languages such as Tashelhiyt have only three phonemic vowels, while Tuareg and Ghadames Berber have a seven-vowel system.”

CUSHITIC: According to Ehret (1987, 1995, and 2008c), the Proto-Cushitic consonant system is to be reconstructed as follows (see Appleyard 2011:42, Table 5.1, for a different reconstruction):

b	d	dz	dl		g	g^w	ʕ
p	t	ts			k	k^w	ʔ
p’	t’	ts’	tl’	č’	k’	k^w’	
f	s		ɬ	š	x	x^w	ħ
	z						
m	n			ɲ	ɲ	$ɲ^w$ (?)	
w	l, r			y			h

Sasse (1979:5) reconstructs the Proto-East Cushitic phonological system as follows (for sound correspondences, see Ehret 2012:115—119):

Plain stops:	voiceless:		t	k	ʔ		
	voiced:	b	d	g			
Glottalized stops:			ɗ	$ɗ_l$	k’		
Fricative:	voiceless:	f	s	š	(x ?)	h	ħ
	voiced:		z				ʕ
Liquids and nasals:		m	n				
			l				
			r				
Semivowels:		w		y			
Vowels:	short:	i	e	a	o	u	
	long:	ii	ee	aa	oo	uu	

Note: Sasse writes *d’* and *$d’_1$* for *ɗ* and *$ɗ_l$*, respectively.

Ehret (1980:37) reconstructs the Proto-Southern Cushitic consonant system thus (see also Takács 2000):

b	d	ḍ	dz	l	(d^y ?)	g	g^w	ʕ
p	t	ṭ	(ts ?)	ɬ	t^y	k	k^w	ʔ
p’	t’	ṭ’	ts’	tl’	t^y’	k’	k^w’	
f	s			r	š	x	x^w	ħ
m	n				n^y	ŋ	$ŋ^w$	
^{m}p	^{n}t	^{n}ṭ	^{n}ts	^{n}ɬ	$^n t^y$	^{n}k	$^n k^w$	
w					y			h

Notes:
1. *ḍ*, *ṭ*, *ṭ’*, and *$^n ṭ$* (Ehret writes *ɖ*, *ʈ*, *ʈ’*, and *$^n ʈ$*) are retroflex.
2. *$^m p$*, *$^n t$*, *$^n ṭ$*, *$^n ts$*, *$^n ɬ$*, *$^n t^y$*, *$^n k$*, and *$^n k^w$* are prenasalized.

3. Labialization could not occur before back vowels in Proto-Southern Cushitic; it is only found before central and front vowels.

Ehret (1980:38) reconstructs the following vowels for Proto-Southern Cushitic:

i	ɨ	u	ī	ɨ̄	ū
e	ʌ	o	ē	ʌ̄	ō
	a			ā	

Appleyard (2006:13) sets up the following table of consonant correspondences for Agaw (Central Cushitic):

Proto-Agaw	Bilin	Xamtanga	Kemant	Awngi
*f	f	f	f	f
*b	b	b	b	b
*m	m	m	m	m
*t	t- -r-	t- -r-	t- -y-	t- -r-/-t-
*d	d	d	d	d
*n	n	n	n	n
*s	s	s	s	s
*z	d	z	z	s
*c	š	s’	š	c
*ʒ	j	z	j	z/dz
*č	š	č’	š	č
*k	k	k/q/k’	k	k
*g	g	g	g	g
*ŋ	n- -ŋ-	ŋ	n- -ŋ-	ŋ
*x	-x-	Ø	Ø	-ɣ-
*kʷ	kʷ	kʷ	kʷ	kʷ/k
*gʷ	gʷ	gʷ	gʷ	gʷ/g
*ŋʷ	ŋʷ	ŋʷ	ŋʷ	ŋʷ/ŋ
*xʷ	-xʷ-	-w-	-w-	-ɣʷ-
*q	k’	x- -q-	x-	ɣ- -q-
*ɣ	-x-	Ø	-ɣ-	-ɣ-
*qʷ	k’ʷ	xʷ- -qʷ-	xʷ	ɣʷ-
*ɣʷ	-xʷ-	-w-	-ɣʷ-	-ɣʷ-
*l	l	l	l	l
*r	-r-	-r-/-l-	-r-	-r-
*w	w	w	w	w
*y	y	y	y	y
*ʔ	ʔ	Ø	Ø	Ø

The Beja / Beḍawye (= North Cushitic) phonological system is as follows (cf. Richard Hudson 1976:99; see also Almkvist 1881:37—45; Maddieson 1984:216; Ruhlen 1975:167):

	Labial	Dental	Palatal	Retro-flex	Velar	Labio-velar	Glottal
Stops	b	t d		ṭ ḍ	k g	k^w g^w	ʔ
Affricates			ǯ				
Fricatives	f						h
Sibilants		s	š				
Nasals	m	n					
Trill		r					
Lateral		l					
Glides	w		y				

Vowels: i u
e o
a

OMOTIC: Amha (2012:434) reconstructs the Proto-Omotic consonant system as follows (see also Bender 1988, 2000, and 2003:310):

	Bilabial	Alveolar	Palatal	Velar	Glottal
Stops: voiceless	p	t		k	
voiced	b	d-		-g-	
glottalized		t'-, ɗ		k'	
Fricatives: voiceless		s	š		h-
Affricates: voiceless		-ts-	-č-		
glottalized		ts'	č'		
Nasals	m	-n-			
Liquids		-l-, -r-			
Glides	w		y-		

Vowels: i e a o u

Notes:
1. The vowels **e* and **u* do not occur word-initially.
2. According to Bender (2003:310), **aa* and **uu* are the only long vowels that can be reconstructed for Proto-Omotic.

CHADIC: According to Newman (1977:9), the consonantal inventory of Proto-Chadic can be reconstructed as follows:

p	t	c	k	k^y	k^w
b	d	j	g	g^y	g^w
ɓ	ɗ	’J			
f	s	(sh)	χ	$χ^y$	$χ^w$
	z				
	ṣ				
m	n				
	hl				
	r				
w	y				

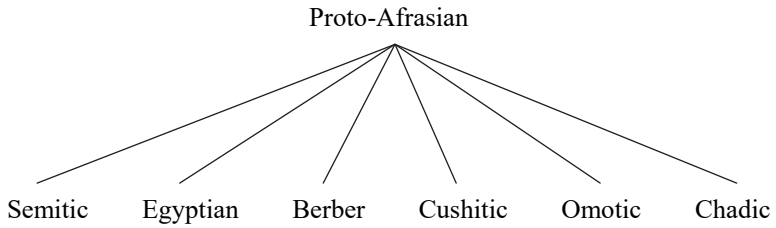
Notes:
1. /c/ = /t^y/; /j/ = /d^y/; /’J/ = /$ɗ^y$/; /sh/ = /š/; /hl/ = /ɬ/.
2. The exact phonetic value of /ṣ/ is unclear.
3. Newman does not reconstruct */l/ for Proto-Chadic, but Jungraithmayr—Ibriszimow do. Jungraithmayr—Ibriszimow also reconstruct a velar ejective */ƙ/ and a voiced fricative lateral */ɮ/. For more information, see the table of sound correspondences in Jungraithmayr—Ibriszimow 1994.I:XX—XXIX.

As noted above, Newman (1977:11) reconstructs four vowels for Proto-Chadic:

i		u
	ə	
	a	

7.15. SUBGROUPING

The traditional subclassification of the Afrasian language family includes the following six branches: Semitic, Egyptian (now extinct), Berber, Cushitic, Omotic, and Chadic (cf. Rubin 2010:3; Katzner 1995:27—29; Hamed—Darlu 2003:80—82; Huehnergard 1992:155; Peust 2012). This may be illustrated by the following chart:



An alternative subclassification is suggested by Militarëv (2009:96):

1. North Afrasian (NAA) (first branching dated to the mid 9th mill. BCE):
    1.1. Semitic
    1.2. African North Afrasian (ANAA):
        1.2.1. Egyptian
        1.2.2. Chado-Berber:
            1.2.2.1. Berber-Canarian
            1.2.2.2. Chadic
2. South Afrasian (SAA):
    2.1. Cushitic
    2.2. Omotic

In his comparative Afrasian dictionary, Ehret (1995:489—490), has proposed a more radical subclassification:

I. Omotic:
    A. North Omotic
    B. South Omotic
II. Erythraean:
    A. Cushitic:
        1. Beja / Beḍawye
        2. Agaw
        3. East-South Cushitic:
            a. Eastern Cushitic
            b. Southern Cushitic
    B. North Erythraean:
        1. Chadic
        2. Boreafrasian:
            a. Egyptian
            b. Berber
            c. Semitic

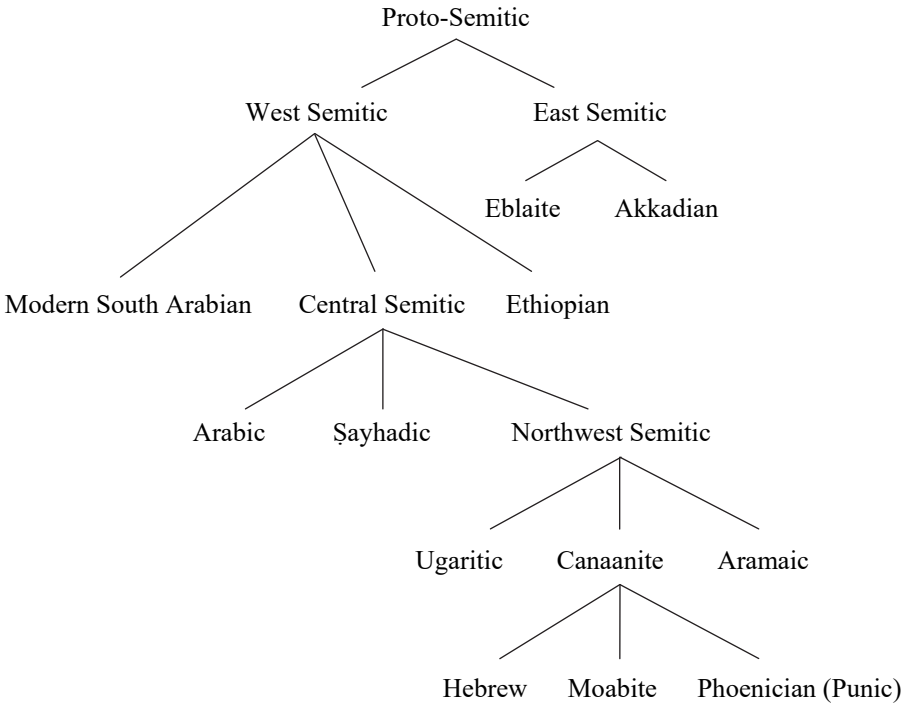
Fleming (2002b:39) adds Ongota to the above chart as a separate branch under Erythraean.

Huehnegard (2004:140), on the other hand, takes a more cautious view:

> A number of morphological features indicate that Berber, Egyptian, and Semitic may constitute a *North Afro-Asiatic* subgroup. A connection between Berber and Chadic has also been suggested. Various other, more comprehensive subgroupings of the Afro-Asiatic branches have been proposed, but none has gained a consensus.

Now, let us look at the individual branches.

SEMITIC: Rubin (2008 and 2010:3—21) presents the current understanding of the subgrouping of the Semitic branch, on the basis of the facts available to date. First, he recognizes a primary division between East and West Semitic. As he notes, this "division has remained relatively uncontroversial for more than a century". East Semitic includes two sub-branches — Eblaite and Akkadian —, while West Semitic is divided into Central Semitic, Ethiopian, and Modern South Arabian. Rubin's views are illustrated in the following chart (see also Faber 1997; Ruhlen 1987:323; Pereltsvaig 2012:96; Lipiński 1997:47—85; Kogan 2015; Groen 2015:5):



EGYPTIAN: The Egyptian branch is represented by a single language throughout its long history of some five thousand years — roughly 3400 BCE to the sixteenth century CE. Though Egyptian is now extinct as a spoken language, the Bohairic dialect of Coptic is still used as the liturgical language of the Coptic Orthodox Church in Egypt. The following developmental stages are typically distinguished, together with their approximate dates (cf. Allen 2013:2—4; Loprieno 1995:5—8; Loprieno—Müller 2012:102—104; Peust 1999:30):

- Old Egyptian 3000 BCE to 2000 BCE
- Middle Egyptian 2000 BCE to 1300 BCE
- Late Egyptian 1300 BCE to 700 BCE
- Demotic 700 BCE to 500 CE
- Coptic 400 CE to 1400 CE

Note: Coptic was still spoken in isolated pockets until the sixteenth century CE (cf. Pereltsvaig 2012:296).

BERBER: As noted by Kossmann (2012:18—20), the subgrouping of the Berber languages is extremely difficult, and no proposal made to date can be considered even close to definitive. Ruhlen (1987:320) gives the following subclassification:

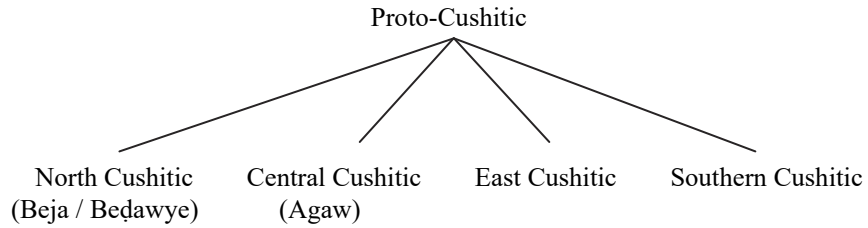
A. †Guanche: †Guanche
B. †East Numidian: †East Numidian (= Old Libyan)
C. Berber proper:
    1. Eastern:
       Siwa
       Awjila-Sokna: Awjila, Sokna, Ghadames
    2. Tuareg:
        a. Northern: Tamahaq
        b. Southern: Tamazheq, Tamasheq
    3. Western: Zenaga
    4. Northern:
        a. Atlas: Shilha, Tamazight
        b. Kabyle: Kabyle
        c. Zenati:
           Shawiya, Tidikelt, Tuat, Riff, Ghmara, Tlemcen, Sheliff Basin
            i. Mzab-Wargla: Guara, Mzab, Wargla, Ghardaia, Tugurt
            ii. East Zenati: Tmagurt, Sened, Jerba, Tamezret, Taujjut, Zwara, Nefusi

Kossmann (2012:18) gets around the issue of subgrouping by giving a geographical distribution of the best known Berber languages and variants:

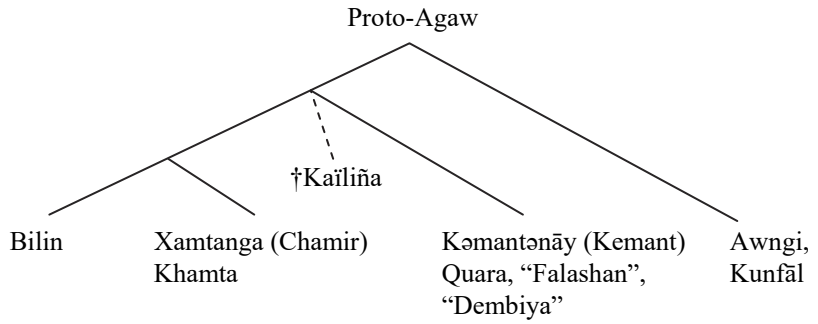
MAURITANIA: Southwest: Zenaga;
MOROCCO: Southwest: Tashelhiyt (also known as Chleuh, Shilha);
    Central and Southest: Central Moroccan Berber (also called Middle Atlas Berber, Tamazight);
    North: Riffian (also Tarifiyt);
    Northeast: Eastern Riffian (Beni Iznasen);
    Northern Sahara: Figuig;
ALGERIA: Northwest: Beni Snous, Chenoua;
    Northwest: Kabyle, Chaouia;
    Northern Sahara: Ouargla, Mzab, Gourara, Touat (now extinct);
TUNISIA: Djerba;
LIBYA: Northwest: Djebel Nefusa;
    Libyan Sahara: Ghadames, Awdjilah, Elfoqaha (now extinct), Sokna (now extinct);

EGYPT: Western Egyptian Sahara: Siwa
TUAREG: Algeria, Libya: Ahaggar;
Niger: Ayer, Iwellemmeden;
Mali: Adagh des Hoghas;
Burkina Faso: Oudalan.

CUSHITIC: Cushitic has four branches:



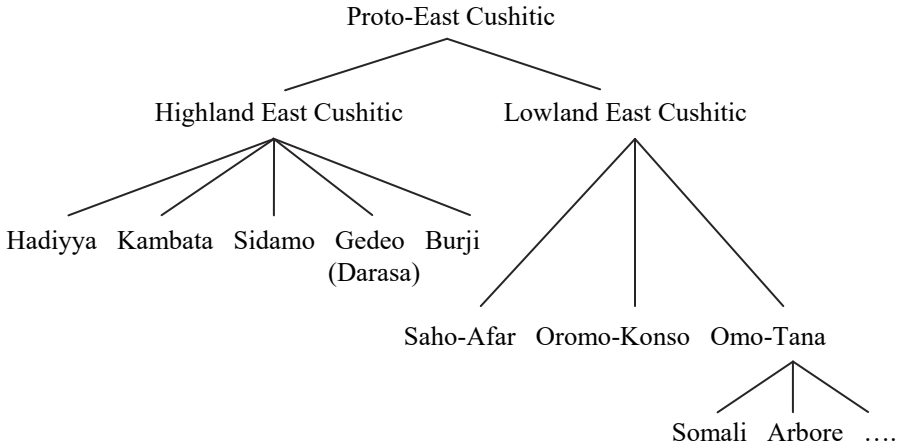
North Cushitic consists of a single language: Beja / Beḍawye. The subgrouping of Central Cushitic (Agaw) is as follows (cf. Appleyard 2006:4):



For East Cushitic, Sasse (1979:3—4) identifies the following modern languages, language groups, or dialect clusters:

1. Saho-Afar (dialect cluster).
2. Omo-Tana (language group, consisting of a western subgroup (Dasenech, Elmolo), an eastern subgroup (Somali, Rendille, Boni), and a northern subgroup.
3. Macro-Oromo or Oromoid (language group, consisting of Galla [Oromo] dialects, including Waata, and the Konso-Gidole group).
4. Sidamo group (language group, consisting of Sidamo, Darasa [Gedeo], Alaba, Kambata, Hadiyya / Libido, and some others).
5. Burji (language; formerly classified with the Sidamo group).
6. Dullay (dialect cluster, consisting og Gawwada, Gollango, Dobase, Harso, Tsamay, and some others; formerly called "Werizoid").
7. Yaaku (Mogogodo; language).

Sasse's Burji-Sidamo group corresponds to Hudson's Highland East Cushitic, while the remainder are included in Hudson's Lowland East Cushitic, as shown below (cf. Hudson 1989:2):



For a slightly different subclassification, cf. Mous 2012:346; see also Ehret 2012: 124.

Ehret (1980:132) gives the following subclassification for Southern Cushitic:

Southern Cushitic:
(a) Rift branch:
  (a.1) West Rift subgroup:
    (i) *Iraqw, Gorowa*
    (ii) Alagwa-Burunge:
      Burunge
      Alagwa
  (a.2) East Rift subgroup:
    (i) *Kw'adza*
    (ii) *Asa*
(b) Mbuguan branch:
    Ma'a
(c) Dahaloan branch:
    Dahalo

OMOTIC: Various attempts at subclassification have been attempted (for details, cf. Amha 2012:425—434). Bender devotes a whole book to the study of Omotic subgrouping, based upon an analysis of morphology. He starts out (2000:2) by giving the following chart. Later (2000:221—235), he summarizes his findings and applies them to the problem of subgrouping.

1. Aroid: Ari (= Bako), Hamer-Bana-Kara, Dimé
2. Non-Aroid:
   - 2.1. Mao: Hozo-Sezo, Bambeshi-Diddesa, Ganza
   - 2.2. Dizoid: Dizi (= Maji), Sheko, Nayi
   - 2.3. TN (= ta / ne):
     - 2.3.1. Kefoid: Bworo (= Shinasha), Anfillo, Kefa-Mocha
     - 2.3.2. Yem (= Janjero)
     - 2.3.3. Gimira: Benc'-Shé
     - 2.3.4. Macro-Ometo:
       - 2.3.4.1. C'ara
       - 2.3.4.2. Ometo

         Southeast: Koré, Zaysé, Gidicho, Gatsamé, Ganjulé

         Northwest: Welaitta Cluster, Malo, Oyda, Basketo, Malé

CHADIC: The Chadic branch of Afrasian contains the largest number of daughter languages. Pereltsvaig (2012:206) places the number around 195 languages, while Frajzyngier—Shay (2012b:236) place the number between 140 and 160 languages (the exact number is still a matter of debate). Frajzyngier—Shay also note that the Chadic languages are the most typologically diverse Afrasian languages. Their subclassification is as follows (2012b:240):

West

A	B
1. Hausa	1. Bade, Ngizim
2. Bole Tangale Bole Pero	2. Miya, Pa'a 3. Guruntum, Saya (Za:r) 4. Don (Zodi)
3. Angas Sura (Mwaghavul) Mupun	
4. Ron, Fyer	

Biu-Mandara

A	B
1. Ga'anda, Hwana (Hona), Jara, Tera	1. Buduma, Kotoko, Logone
2. Bura, Cibak, Margi	2. Musgu
3. Bana, Higi, Kapsiki	3. Gidar
4. Glavda, Guduf, Lamang, Hdi	
5. Ouldene, Zulgo	
6. Sukun (Sukur)	
7. Daba, Hina (Mina)	
8. Bachama, Tsuvan	

East

A	B
1. Somrai, Tumak	1. Bidiya, Dangla, Migama, Mubi
2. Lele, Nancere, Tobanga	2. Mukulu
3. Kera, Kwang	3. Barain, Saba, Sokoro

Masa

Masa
Mesme
Musey
Zime-Lame
Zumaya

A more comprehensive subclassification is given by Jungraithmayr—Ibriszimow 1994. See also Newman 1977:4—7.

For alternative subgrouping schemata and alternative language names, cf. Ruhlen 1987:320—323, Blench 2000, and Orël—Stolbova 1995:xi—xiii. As can be clearly seen from the above discussion, there remain many uncertainties regarding the subgrouping of the Afrasian daughter languages, with the Chadic branch being particularly challenging.

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References: Arbeitman (ed.) 1988a; Bergsträsser 1928 and 1983; Bomhard 2014b; Brockelmann 1908, 1908—1913, 1910, and 1916; Bynon (ed.) 1984; Bynon—Bynon (eds.) 1975; D. Cohen 1968; D. Cohen (ed.) 1988; M. Cohen 1947, 1952, and 1953; Comrie (ed.) 1987 and 1990; Diakonoff 1965, 1974, 1988, and 1992; Diakonoff—Militarëv—Porxomovsky—Stolbova 1987; Ehret 1980 and 1995; Frajzyngier—Shay (eds.) 2012; Gray 1934; Gzella (ed.) 2012; Hetzron (ed.) 1997; Hodge (ed.) 1971; Huehnergard 2004; Jungraithmayr—Mueller (eds.) 1987; Kaye (ed.) 1997 and 2007; Kogan 2011a; Lecarme—Lowenstamm—Shlonsky (eds.) 2002; Leslau 1988; Lipiński 1997 and 2001; Moscati (ed.) 1964; O'Leary 1923; Orël—Stolbova 1988, 1990, and 1995; Militarëv 2000, 2002, 2005, 2010, 2011, 2012, and 2014; Petráček 1985, 1976, 1988b, and 1989; Porxomovsky (ed.) 1987; Rössler 1981; Takács 1999 and 2011a; Takács (ed.) 2008; Weninger (ed.) 2011; Woodard (ed.) 2004; W. Wright 1890.

CHAPTER EIGHT

A SKETCH OF PROTO-URALIC PHONOLOGY

8.1. INTRODUCTION

Even though the Uralic language family is part of a larger grouping called "Uralic-Yukaghir" (cf. Ruhlen 1987:64—65; de Smit 2017; Piispanen 2013 and 2017) (Abondolo 1998a:8—9 and Fortescue 1998:44—47 are more cautious), the main part of this chapter will be devoted to Uralic. Yukaghir will be dealt with separately in an Appendix.

Vowel harmony and consonant harmony are two notable phonological characteristics of the Uralic languages, though not all languages of the family exhibit these features. In those Uralic languages exhibiting vowel harmony, the system is generally based upon a front ~ back contrast, most often with the vowels *i* and *e* being neutral in regards to this contrast and thus able to combine freely with either front or back vowels, though absolute consistency is unusual. The vowel harmony systems found in the Uralic languages thus differ in this respect from those found in the Altaic languages, especially Turkic and Mongolian, where more consistent systems are the rule. Cf. Abondolo 1998a:13—18; Collinder 1965:65—67; Comrie 1988:454—457; Marcantonio 2002:82.

As an active phonological feature, consonant harmony (German *Stufenwechsel*) is not as widespread as vowel harmony, being found exclusively in Balto-Finnic and Lapp (Saami) (though there are traces in the Erza dialect of Mordvin [cf. Zaic 1998:190] as well as Tavgi [Nganasan], Forest Yurak [Forest Nenets], and Southern Selkup Samoyed [cf. Collinder 1965:67—73]). Consonant harmony is based upon a contrast, in different forms of the same word, between (1) medial voiceless geminated stops at the beginning of an open syllable versus medial single voiceless stops at the beginning of a closed syllable on the one hand and between (2) medial single voiceless stops at the beginning of an open syllable versus medial voiced stops, fricatives, or zero at the beginning of a closed syllable on the other hand. Diachronically, the system of consonant harmony may be viewed as a weakening of the phonetic value of a consonant before closed syllables. This resulted in a correlation of so-called "strong-grade" variants with open syllables and so-called "weak-grade" variants with closed syllables. Even though consonant harmony began as a purely phonetic process, however, it has since become morphologized in those languages where it developed, and a certain amount of leveling has also taken place. In Estonian, in particular, so many diachronic changes have taken place that there is no longer a readily discernible correlation between strong-grade and open syllables nor between weak-grade and closed syllables. Cf. Abondolo 1998a:11—12; Comrie 1988:457—459; Marcantonio 2002:83—84.

As noted by Vajda (2003:117), the "constituent branches [of Uralic] have undergone extensive areal contact mutually as well as with non-Uralic languages".

8.2. THE PROTO-URALIC CONSONANT SYSTEM

There is broad agreement among Uralic scholars concerning Proto-Uralic consonantism. Though most consonants could appear both initially and medially, a small number were found only medially. Word initially, Proto-Uralic had the following sounds (cf. Collinder 1965:75—83): **p-*, **t-*, **k-*, **č-*, **t^{y}-* (traditional **ć-*), **s-*, **s^{y}-* (traditional **ś-*), **δ^{y}-* (traditional **δ′-*), **y-*, **w-*, **l-*, **l^{y}-* (traditional **l′-*), **r-*, **n^{y}-* (traditional **ń-*), **n-*, and **m-*. Medially between vowels, the following sounds were found (cf. Collinder 1965:83—92): **-p-*, **-t-*, **-k-*, **-č-*, **-t^{y}-*, **-s-*, **-s^{y}-*, **-š-*, **-x-* (traditional **-γ-*), **-δ-*, **-δ^{y}-*, **-y-*, **-w-*, **-l-*, **-l^{y}-*, **-r-*, **-ŋ-*, **-ŋk-*, **-ŋt-*, **-n-*, **-nt-*, **-n^{y}-*, **-m-*, **-mt-*, and **-mp-*. Note: In my opinion, traditional **δ* and **δ′* are to be interpreted as the voiceless and voiceless palatalized lateralized affricates **t͡ɬ* and **t͡ɬ^{y}*, respectively — to maintain continuity with the traditional reconstruction, they are written **δ* and **δ^{y}*, respectively, in this book. I also believe that the phoneme traditionally written **γ* was most likely the voiceless velar fricative **x* instead (as reconstructed by Sammallahti and Abondolo below). Palatalization is indicated as *C^{y}* throughout this book.

The Proto-Uralic consonant system may be reconstructed as follows (cf. Abondolo 1998a:12; Austerlitz 1968:1375—1377; Bakró-Nagy 1992:16; Janhunen 1982:23—24 and 1992:208; Décsy 1990:25—28; Rédei 1986—1988:ix; Fortescue 1998:127) (for sound correspondences, cf. Collinder 1965:75—103) (for examples, cf. Collinder 1960:45—193) (for Proto-Finno-Ugrian, cf. Kálmán 1988:401) (for Proto-Samoyed, cf. Janhunen 1977b:9), though it should be noted that the number of fricatives and affricates to be reconstructed for Proto-Uralic as well as their precise phonetic qualities are still a source of controversy (cf. Janhunen 1982:24):

p	t		č	t^{y}	k
	δ (= t͡ɬ)			δ^{y} (= t͡ɬ^{y})	x
	s		š	s^{y}	
m	n			n^{y}	ŋ
	r	l		(l^{y})	
w				y	

A slightly different system is reconstructed by Sammallahti (1988:480—483):

p			m				w	
t	s	c	n	d	r	l		
	s^{y}		n^{y}	d^{y}			y	
k			ŋ					
								x

Marcantonio (2002:105) lists the following traditionally reconstructed Proto-Uralic consonants (her transcription is maintained):

1. The (voiceless) plosives: **p*, **t*, **k*;
2. The glides: **w* and **j*;
3. The (voiceless) sibilants: generally three: **s*, **ś*, **š*; or two: **s* and **ś*;
4. The ordinary as well as the palatalized liquids: **r*, **l*/**ĺ* and nasals **m*, **n*/**ń*;
5. The affricates: generally one: **č*, or two: **č* and the palatal(ized) **ć*.

Next, the phonological system proposed by Abondolo (1998a:12) is as follows:

Glides:	w			y	x
Nasals:	m	n		n^y	ŋ
Stops:	p	t			k
Affricates:			č	c^y	
Fricatives:		s		s^y	
Lateral:		l			
Trill:		r			

Abondolo also reconstructs **δ* and **$δ^y$*, whose phonetic status is uncertain. According to Abondolo (1998a:12), **l^y* and **š* were later developments and did not exist in Proto-Uralic. See also Marcantonio 2002:106.

Finally, the most recent attempt to reconstruct the consonant inventory of Proto-Uralic is that of Aikio (to appear, p. 7):

p	t				k
			č		
	s	s^y	š (?)		
m	n	n^y			ŋ
	l				
	r				
w				j	
	d	d^y			x (?)

Aikio notes that the phonetic values of **d* (= traditional **δ*) and **d^y* (Aikio writes **d′* = traditional ** δ′*) are particularly difficult to reconstruct. He does not offer a solution to this problem, instead stating that “the question of the phonetic quality of the two consonants remains unresolved”. Aikio also notes that the phonetic status of both **š* and **x* in the Proto-Uralic consonant inventory is questionable.

8.3. VOWELS

There are still many uncertainties regarding the reconstruction of the Proto-Uralic vowels. Décsy (1990:22), for example, has proposed the following system:

i	u
e	o
ä	a

At the Proto-Uralic level, the system of vowel harmony was based exclusively upon a front ~ back contrast. This affected the distributional patterning of vowels in such a way that only front vowels could combine with front vowels and only back vowels could combine with back vowels in a given word. The basic rule is that the vowels of non-initial syllables adjust to the vowel of the initial syllable. According to Décsy (1990:36), the following combinations were permitted:

Front	Back
i ~ ä	u ~ a
e ~ ä	o ~ a
ä ~ ä	a ~ a

A key point in this scheme is the assumption by Décsy (1990:39—43) that only **ä* and **a* could appear in non-initial syllables. The traditional view among Uralic scholars, however, is that **i*/**ɨ* (or **e*) could also occur in non-initial syllables. Indeed, the evidence from the Uralic daughter languages strongly supports the reconstruction of the opposition **i*/**ɨ* (or **e*) versus **a*/**ä* in non-initial syllables. Moreover, if this distinction is not reconstructed, it is impossible to explain many secondary consonant developments in the Samoyed languages.

Janhunen (1982:24 and 1992:208) reconstructs eight vowels for Proto-Uralic:

	Unmarked Front	Marked Front	Marked Back	Unmarked Back
High	i	ü	ï	u
Middle	e			o
Low	ä			a

Sammallahti (1988:481), on the other hand, reconstructs the following vowels for Proto-Uralic, all of which could appear in stressed syllables (in general, Sammallahti's views are supported by Abondolo 1998a:13—18, especially p. 16, though Abondolo devotes considerable space to a discussion of alternative proposals, including the suggestion that Proto-Uralic may have had phonemic long vowels):

u	ɨ	ü	i
o			e
å (a)			ä

According to Sammallahti, only the following vowels could appear in non-initial syllables:

ɨ	i
å (a)	ä

Sammallahti reconstructs the following system of vowel harmony:

Front vowels			Back Vowels		
i	~	ä, i	ɨ	~	å, ɨ
ü	~	ä, i	u	~	å, ɨ
e	~	ä, i	o	~	å, ɨ
ä	~	ä, i	å	~	å, ɨ

Though front rounded and back (or central) unrounded vowels are typical characteristics of most Uralic languages, they are innovations within Uralic proper and, consequently, are not to be reconstructed for Proto-Nostratic. There have been several attempts to show that phonemic long vowels also existed in Proto-Uralic. However, the prevailing view appears to be that phonemic long vowels were secondary developments in the Uralic daughter languages (cf. Lehtinen 1967) and not part of the phonological system of the Uralic parent language.

Finally, Aikio (to appear, p. 5) reconstructs the following vowels for Proto-Uralic:

i	ü	į	u
e			o
ä			a

According to Aikio (to appear, pp. 15—16), “due to the phonotactic limitations of vowel distribution, the stem-final vowels in the second syllable were mostly (or perhaps completely) limited to **a*, **ä* and **i*.”

8.4. ACCENTUATION

There were probably three degrees of stress contrast in Proto-Uralic (cf. Décsy 1990:48—49): (A) strongest, (B) weak, and (C) weakest. These are relative terms — the actual intensity differences between these three degrees was not great. The rule was that the strongest degree always fell on the first syllable of a word, and the weakest always on the last. The weak degree fell on odd non-initial syllables (except for the final syllable), while the weakest degree fell on even non-final syllables and the final syllables. Cf. also Sammallahti 1988:480.

8.5. ROOT STRUCTURE PATTERNING

The Proto-Uralic root structure patterning was fairly straightforward (cf. Bakró-Nagy 1992, especially pp. 133—158; Janhunen 1982:25—27):

1. There were no initial consonant clusters in Proto-Uralic (cf. Décsy 1990:26). Medial clusters were permitted, however (cf. Décsy 1990:27).
2. Three syllable types were permitted: **V*, **CV*, **CVC* (cf. Décsy 1990:34—35). Initially, **V* comes from earlier **HV*, upon loss of the preceding laryngeal.
3. All Proto-Uralic words ended in a vowel (cf. Décsy 1990:26 and 54).
4. Derivational suffixes had the form **-CV* (cf. Décsy 1990:58). Note: Proto-Uralic did not have prefixes or inflixes (cf. Décsy 1990:58).

Proto-Uralic did not differentiate between nominal and verbal stems (cf. Décsy 1990:56). Only pronouns existed as an independent stem type. Moreover, adjectives probably did not exist as a separate grammatical category (cf. Abondolo 1998a:18).

Bakró-Nagy (1992:8 and 14) reconstructs the general structure of Proto-Uralic root morphemes as follows:

$$\#C(V)\ \left\{ \left\{ \begin{matrix} CCC \\ CC \\ C \end{matrix} \right\}\ V \right\}\ (+CV)\#$$

Aikio (to appear, pp. 15—17), categorizes Proto-Uralic morphemes into three types, according to their phonological structure: (1) content word stems, (2) function word stems, and (3) suffixes. Content words were always polysyllabic: **(C)V(C)CV-*, while most function words were monosyllabic: **(C)V-*. Aikio further notes (to appear, p. 16) that several marginal content word stem shapes can be reconstructed. Specifically, he mentions **(C)V(C)CVw-* and **(C)V(C)CVC(i)-*.

8.6. THE POSITION OF YUKAGHIR

Work on Yukaghir is still in its infancy, though the publication in 2006 of *A Historical Dictionary of Yukaghir* by Irina Nikolaeva has done much to advance the field. Indeed, I have relied heavily on this dictionary for the Yukaghir forms I have cited throughout this book, though I find the reconstructions problematic and have only included them when I felt that they helped clarify how particular Yukaghir forms fit with the material cited from other Nostratic daughter languages. The paper "The Uralic-Yukaghir Lexical Correspondences: Genetic Inheritance, Language Contact or Chance Resemblance?" (to appear in *Finnisch-Ugrische Forschungen* 62 [2013]) by Ante Aikio is also important. In this paper, Aikio evaluates previous attempts by various scholars to establish a genetic relationship between Uralic and Yukaghir. Aikio does not discount the possibility that such a relationship may

ultimately be established at some future date, but he claims that it cannot be supported on the basis of the evidence presented to date. Finally, Macario (2012:25) ends his study of the genetic affiliation of Yukaghir by noting:

> Opinions on the genetic affiliation of Yukaghir diverge massively. Classification attempts range from language isolate theories to very long-range hypothesis such as Ural-Altaic-Yukaghir, Eskimo-Aleut-Yukaghir, and Nostratic etc. It is self-evident that it is hard to find a congruency within these theories. There is a fair amount of linguistic data and an even bigger amount of analysis and comparative research based on sometimes old data available. The most accepted and plausible classification attempt seems to be that there is a lot in common between Yukaghir and Samoyed (a branch of Uralic). But the linguistic data only will not suffice to determine anything. There had been language contact in this area; hence at least aspects of people's migration and cultural exchange should be taken into account as well. We do not know enough about the *Urheimat* of these peoples. Additionally, long-rangers seem to have shown major correspondences between Uralic and Altaic in particular. It is harder to prove such theories than to disprove them showing counter-evidence, so I believe.
>
> On the basis of Nikolaeva's past work one could do more extensive etymological and morphosyntactic research. Over 170 Proto-Yukaghir affixes could be compared to Proto-Uralic (i.e. on the basis of Marcantonio 2002 and others). The major disagreement between Jochelson and Collinder on the vowel harmony could be restudied. One could also start to analyse available folklore or other cultural data such as Jochelson's descriptions on the tribes dating back to the early 20th century or the very few audio recordings available. The Nenets people seem to have some similar ways of living.
>
> Due to the nature of the problem — a dying language, an immense amount of analysis being done and the tininess of researchers interested in this particular question (which is one among really a lot of questions) — it might be — unfortunately — impossible to determine the precise kinship of Kolyma and Tundra Yukaghir in the future.

Clearly, there is more work to be done here.

•••

The tables of correspondences on the following pages are based primarily upon Collinder 1965:75—103. For comprehensive discussions of the developments in the individual Uralic daughter languages, see Abondolo (ed.) 1998; Aikio to appear, pp. 7—11; Collinder 1960:45—193; Cavoto 1998; Sammallahti 1988:478—554; and (for Samoyed) Hajdú 1968:57—64. Due to the uncertainties surrounding the reconstruction of vowels in Proto-Uralic, only consonants are presented in the following tables (see Zhivlov 2010 and 2014 for information on the reconstruction of the vowels).

8.7. CORRESPONDENCES

In the following tables, the conventions established by Collinder (1965:75) are observed: Regional (dialectal) variants are noted in parentheses ( ), infrequent variants are noted in square brackets [ ], and regular alternations are indicated by ~.

A. INITIAL CONSONANTS — BEFORE BACK VOWELS:

Proto-Uralic	*p-	*t-	*č-	*tʸ-	*k-	*δʸ-	*s-	*sʸ-
Finnish	p	t	h	s (ć č c)	k	t	s	s
Lapp / Saami	p (b)	t (d)	c	ć [š]	k (g)	t (d)	s	ć
Mordvin	p	t	č (š)	ś ć	k	l′	s	ś
Cheremis / Mari	p	t	č (c ć)	ć (c)	k	l′	š (s)	š [s ś]
Votyak / Udmurt	p [b]	t [d]	č š ǯ	ć ǵ	k [g]	l′	s	ś
Zyrian / Komi	p [b]	t [d]	č ǯ (ć)	ć ǵ	k [g]	l′	s	ś
Vogul / Mansi	p	t	š (s)	ś (ć) s (š)	q (h k)	l′	t	s
Ostyak / Xanty	p	t	č (š s)	t′ (ś) s	k (h)	j	þ (j Ø)	s
Hungarian	f [b]	t [d]	š	ć š s	h		Ø	s
Yurak / Nenets	p	t	t	ś	h (k)	j	t	s (h)
Tavgi / Nganasan	f	t	t	s	k	j	t	s
Yenisei / Enets	f (p)	t	t		k	j	t	s
Selkup Samoyed	p	t	t (č c)	š (s h)	q [k]	t′ (ć)	t	s (h)
Kamassian	p b h	t	t		k	l n	t	s

Proto-Uralic	*y-	*w-	*l-	*lʸ-	*r-	*nʸ-	*n	*m-
Finnish	j	v	l	l	r	n	n	m
Lapp / Saami	j	v	l	l	r	ń	n	m
Mordvin	j	v	l	l	r	n	n	m
Cheremis / Mari	j (d′)	β	l	l r	r [l]	n	n	m
Votyak / Udmurt	j (d′)	v	l	l′	ǯ (ž) ǵ (ź)	ń	n	m
Zyrian / Komi	j	v	l [v]	l′	r	ń	n	m
Vogul / Mansi	j l′	β	l	l′	r	ń	n	m
Ostyak / Xanty	j	u̯	l þ t	l′ (þ′ t′) j	r	ń	n	m
Hungarian	j d′	v	l	l?	r	ń	n	m
Yurak / Nenets	j (d′)	β	l (þ r)	j	l (þ? r)	ń	n	m
Tavgi / Nganasan	j	b	l	l j?	l	ń	n	m
Yenisei / Enets	j	b	l	j	l	ń	n	m
Selkup Samoyed	t′ k (ć)	ku̯ (k)	l	t′ ć	l	ń	n	m
Kamassian	t′ d′	b β	l	t′ ć	l	n ń	n	m [b]

B. INITIAL CONSONANTS — BEFORE FRONT VOWELS:

Proto-Uralic	*p-	*t-	*č-	*tʸ-	*k-	*δʸ-	*s-	*sʸ-
Finnish	p	ti ~ si	h	s (ć č c)	k	t	s	s
Lapp / Saami	p (b)	t (d)	c	ć [š]	k (g)	t (d)	s	ć
Mordvin	pʹ	tʹ	č (š)	ś ć	kʹ	lʹ	s (ś)	ś
Cheremis / Mari	p	t	č (c ć)	ć (c)	k	lʹ	š (ś)	š [s ś]
Votyak / Udmurt	p [b]	t [d]	č š ǯ	ć ǵ	k [g]	lʹ	s	ś
Zyrian / Komi	p [b]	t [d]	č ǯ (ć)	ć ǵ	k [g]	lʹ	s	ś
Vogul / Mansi	p	t	š (s)	ś (ć) s (š)	k	lʹ	t	s
Ostyak / Xanty	p	t	č (š s)	tʹ (ś) s	k	j	þ (j Ø)	s
Hungarian	f [b]	t [d]	š	ć š s	k (g)		Ø	s
Yurak / Nenets	pʹ	tʹ [ć]	tʹ [ć]	ś	ś	j	tʹ	s (h)
Tavgi / Nganasan	f	t	t	s	s	j	t	s
Yenisei / Enets	f (p)	t	t		s	j	t	s
Selkup Samoyed	p	t	t (č c)	š (s h)	š (s)	tʹ (ć)	t	s (h)
Kamassian	p b h	š t	t		š	l n	t	s

Proto-Uralic	*y-	*w-	*l-	*lʸ-	*r-	*nʸ-	*n-	*m-
Finnish	Ø	Ø v	l	l	r	n	n	m
Lapp / Saami	j	v Ø	l	l	r	ń	n	m
Mordvin	Ø (j)	Ø ~ v	lʹ	lʹ	ŕ	ń	ń	ḿ
Cheremis / Mari	*ji > i	β ~ Ø	l [lʹ]	l r	r [l]	n [j]	n [ń]	m
Votyak / Udmurt	*ji > i	v	l lʹ	lʹ	ǯ (ž) ǵ (ź)	ń	n ń	m
Zyrian / Komi	j	v	lʹ	lʹ	r	ń	n ń	m
Vogul / Mansi	j Ø	β ~ Ø	l	lʹ	r	ń	n	m
Ostyak / Xanty	j Ø	u̯ ~ Ø	l þ t	lʹ (þʹ tʹ) j	r	ń	n	m
Hungarian	*ji > i	v ~ Ø	l	l?	r	ń	n [ń]	m
Yurak / Nenets	j (dʹ)	β ~ Ø	lʹ (þʹ ŕ)	j	lʹ (þʹ? ŕ)	ń	n	ḿ
Tavgi / Nganasan	j	b	l	l j?	l	ń	n ń	m
Yenisei / Enets	j	b	l	j	l	ń	n ń	m
Selkup	Ø?	ku̯ ~ Ø	l	tʹ ć	l	ń	n	m
Kamassian	tʹ dʹ	b β	l	tʹ ć	l	n ń	n ń	m [b]

Notes:

1. Proto-Uralic **w*-: the developments shown in the above table are for **w*- before rounded vowels.
2. Proto-Uralic **l*- and **n*-: the developments shown in the above table are for **l*- and **n*- before *ä*, *e*, and *i*.

C. MEDIAL CONSONANTS AND CONSONANT CLUSTERS — BETWEEN BACK VOWELS:

Proto-Uralic	*-p-	*-t-	*-š-	*-tʸ-	*-k-	*-δʸ-	*-s-	*-sʸ-
Finnish	p ~ v	t ~ d	h	ts s	Ø v j	t ~ d	s	s
Lapp / Saami	pp ~ p	tt ~ δ	ss ~ s	ćć ~ ć	kk (hk) ~ γ k	δδ ~ δ	ss ~ s	ćć ~ ć
Mordvin	v	d	ž	ć	v	d	z	ź [ś]
Cheremis / Mari	Ø	-t -δ-	ž (z?)	ć (c ʒ)	Ø j	δ Ø	ž (z)	ž š
Votyak / Udmurt	Ø	Ø	ž	ć ʑ	Ø [k]	l′	z	ś ź
Zyrian / Komi	Ø	Ø	ž	ć ʑ	Ø [k]	l′	z	ś ź
Vogul / Mansi	p	t	t	ć	γ(h)[Øw]	l′	t	s z
Ostyak / Xanty	p	t (d)	l (þ t)	ś (ź t′)	γ(h)[Øw]	j	l (þ t)	s (z)
Hungarian	v	z	Ø?	s d′ š?	v Ø	j d′	s	s
Yurak / Nenets	b	-ʔ (-t) δ	δ d ~ -ʔ	ć ś	h	j	-ʔ (-t) δ	s
Tavgi / Nganasan	f ~ b	t ~ d	t ~ d	s ~ j	k ~ g	j Ø	t ~ d	s
Yenisei / Enets	b	d (r)	d (r)	s	h		d (r)	s
Selkup Samoyed	p (b)	t (d)	t (d)	s	k (g; kk ~ g/k)	d′ t′ ć ʑ	t (d)	s
Kamassian	b	d ~ -ʔt	d ~ -ʔt	s?	g	j Ø?	d ~ -ʔt	s

Notes: Medial *-*č*-: Finnish *t*, *h*; Lapp / Saami *cc (hc)* ~ *c*, *hcc* ~ *cc (hc)*, *ss* ~ *s*, *s's* ~ *s*; Cheremis / Mari *š, ž*; Votyak / Udmurt and Zyrian / Komi *č*, *ʒ́*, *š*, *ž*. Otherwise = *č*-. Cf. Collinder 1965:84.

Proto-Uralic	*-y-	*-w-	*-l-	*-lʸ-	*-r-	*-nʸ-	*-n-	*-m-
Finnish	j [Ø]	v [Ø]	l	l	r	n	n	m [v]
Lapp / Saami	ďď′ ~ j	vv ~ v	ll ~ l	l	rr ~ r	ńń ~ ń	nn ~ n	mm~m
Mordvin	j	v	l	l	r	ń	n	m [v]
Cheremis / Mari	j	Ø	l	l r	r	ń [m]	n	m [Ø]
Votyak / Udmurt	j jd	Ø	l	l′	r	ń	n	m
Zyrian / Komi	j jd	Ø	l [v]	l′	r	ń	n	m
Vogul / Mansi	j	β Ø	l [r]	l′	r	ń	n	m
Ostyak / Xanty	j	u̯ (γ -h)	l þ t	l′ (þ′ t′) j	r	ń	n	m
Hungarian	j [v]	v ~ Ø	l [r]	l?	r	ń	n	m v Ø
Yurak / Nenets	j	Ø	l (þ r)	j	r (þ)	j	n	β b (m)
Tavgi / Nganasan	j	Ø	l	l j?	r	j Ø?	n	m
Yenisei / Enets	j	Ø	ð (r)	j	ð r	ń	n	ʔ b w?
Selkup Samoyed	t′ ć	Ø	l	t′ ć	r	ń	n	m
Kamassian	j	Ø	l	t′ ć	r	j	n	m

Proto-Uralic	*-x-	*-δ-	*-ŋ-	*-ŋk-	*-ŋt-	*-nt-	*-mt-	*-mp-
Finnish	k ~ Ø	t ~ d	v Ø [m]	ŋk ~ ŋŋ	t	nt ~ nn	nt ~ nn	mp ~ mm
Lapp / Saami	kk ~ γ	δδ ~ δ	ŋŋ ~ ŋ	ŋk ~ ŋg	u̯t	nt ~ nd	mt	mp ~ mb
Mordvin	v j Ø	d	(v j) Ø	ŋg	nd?	nd	nd	mb
Cheremis / Mari	Ø	Ø	n ŋ [m]	ŋg (γ)	ŋ + δ	nd δ	mδ	mb (m)
Votyak / Udmurt	j Ø	l Ø	ŋ n ń m	g	d	d	d	b
Zyrian / Komi	j Ø	l Ø	n ń m	g	d	d	d	b
Vogul / Mansi	γ j Ø	l [Ø?]	ŋk (ŋh)	ŋk (ŋh)	βt	nt	nt	mp
Ostyak / Xanty	γ u̯ Ø	l (þ t)	ŋk (ŋh)	ŋk (ŋh)	ŋət ŋt nt	nt	mət nt	m
Hungarian	v Ø	l	g v j Ø	g		d	d	b
Yurak / Nenets	β Ø	r d	ŋ Ø	ŋk	mt	n	mt	mp (mb)
Tavgi / Nganasan	Ø	r d?	ŋ [n]	ŋk ~ ŋ	mt ~ md?	nt ~ nd	mt ~ md?	ŋf ~ mb
Yenisei / Enets	Ø	r (δ)	ŋ [n]	gg	dd	dd	dd	b
Selkup Samoyed	Ø w	r t	ŋ (γ Ø -k)	ŋk	md	nd	md	mb
Kamassian	Ø	r	ŋ Ø	ŋk ŋg	mn	n	mm	m

D. MEDIAL CONSONANTS AND CONSONANT CLUSTERS — BETWEEN FRONT VOWELS:

Proto-Uralic	*-p-	*-t-	*-š-	*-tʸ-	*-k-	*-δʸ-	*-sʸ-	*-sʸ-
Finnish	p ~ v	s	h	ts s	Ø v j	t ~ d	s	s
Lapp / Saami	pp ~ p	tt ~ δ	šš ~ š	ćć ~ć	kk (hk) ~ γ k	δδ ~ δ	šš ~ š	ćć ~ ć
Mordvin	v′	d′	š	ć	j	d′	ź	ź [ś]
Cheremis / Mari	j Ø	-t -δ-	š (z?)	ć (c ʒ)	Ø j	δ Ø	ž (ź)	ž š
Votyak / Udmurt	Ø	Ø	ž	ć ʒ́	Ø [k]	l′	z	ś ź
Zyrian / Komi	Ø	Ø	ž	ć ʒ́	Ø [k]	l′	z	ś ź
Vogul / Mansi	p	t	t	ć	γ (h) [Ø w]	l′	t	s z
Ostyak / Xanty	p	t (d)	l (þ t)	ś (ź t′)	γ (h) [Ø w]	j	l (þ t)	s (z)
Hungarian	v	z	Ø?	s d′ š?	v Ø	j d′	s	s
Yurak / Nenets	b′	d′ (t′ ć)	d′?	ć ś	ś	j	d′ (t′ć)	s
Tavgi / Nganasan	f ~ b	t ~ d	t ~ d	s ~ j	s?	j Ø	t ~ d	s
Yenisei / Enets	b	d (r)	d (r)	s	s?		d (r)	s
Selkup Samoyed	p (b)	t (d)	t (d)	s	š (s)?	d′t′ć ʒ́	t (d)	s
Kamassian	b	d ~ -ʔt	d ~ -ʔt	s?	š?	j Ø?	d ~ -ʔt	s

Notes: Medial *-*č*-: Finnish *t*, *h*; Lapp / Saami *cc (hc)* ~ *c*, *hcc* ~ *cc (hc)*, *ss* ~ *s*, *s's* ~ *s*; Cheremis / Mari *š, ž*; Votyak / Udmurt and Zyrian / Komi *č*, *ǯ*, *š*, *ž*. Otherwise = **č*-. Cf. Collinder 1965:84.

Proto-Uralic	*-y-	*-w-	*-l-	*-lʸ-	*-r-	*-nʸ-	*-n-	*-m-
Finnish	j [Ø]	v [Ø]	l	l	r	n	n	m [v]
Lapp / Saami	d′d′ ~ j	vv ~ v	ll ~ l	l	rr ~ r	ńń ~ ń	nn ~ n	mm ~ m
Mordvin	j	v′	l′	l	ŕ	ń	ń	ḿ v′
Cheremis / Mari	j	Ø (j)	l [(l′)]	l r	r [l]	ń [m]	ń j	m [Ø]
Votyak / Udmurt	j jd	Ø	l (w)	l′	r	ń	n	m
Zyrian / Komi	j jd	Ø	l [v]	l′	r	ń	n	m
Vogul / Mansi	j	β Ø	l [r]	l′	r	ń	n	m
Ostyak / Xanty	j	u̯ (γ -h)	l þ t	l′ (þ′ t′) j	r	ń	n	m
Hungarian	j [v]	v ~ Ø	l [r]	l?	r	ń	n ń	m v Ø
Yurak / Nenets	j	Ø	l′ (þ′ ŕ)	j	ŕ (þ′)	j	ń	β′ b′ (ḿ)
Tavgi / Nganasan	j	Ø	l	l j?	r	j Ø?	n	m
Yenisei / Enets	j	Ø	ð (r)	j	ð r	ń	ń	ʔ b w?
Selkup Samoyed	t′ ć	Ø	l	t′ ć	r	ń	n	m
Kamassian	j	Ø	l	t′ ć	r	j	n	m

Proto-Uralic	*-x-	*-δ-	*-ŋ-	*-ŋk-	*-ŋt-	*-nt-	*-mt-	*-mp-
Finnish	k ~ Ø	t ~ d	v Ø [m]	ŋk ~ ŋŋ	t	nt ~ nn	nt ~ nn	mp ~ mm
Lapp / Saami	kk ~ γ	δδ ~ δ	ŋŋ ~ ŋ	ŋk ~ ŋg	u̯t	nt ~ nd	mt	mp ~ mb
Mordvin	v j Ø	d′	(v′ j) Ø	ŋg	nd?	nd	nd	mb
Cheremis / Mari	Ø	Ø	n ŋ [m]	ŋg (γ)	ŋ + δ	nd δ	mδ	mb
Votyak / Udmurt	j Ø	l Ø	ŋ n ń m	g	d	d	d	b
Zyrian / Komi	j Ø	l Ø	n ń m	g	d	d	d	B
Vogul / Mansi	γ j Ø	l [Ø?]	ŋk (ŋh)	ŋk (ŋh)	βt	nt	nt	mp
Ostyak / Xanty	γ u̯ Ø	l (þ t)	ŋk (ŋh)	ŋk (ŋh)	ŋət ŋt nt	nt	məṭ nt	m
Hungarian	v Ø	l	g v j Ø	g		d	d	b
Yurak / Nenets	β Ø	d′	j [ń] Ø	ŋk	mt	n	mt	mp (mb)
Tavgi / Nganasan	Ø	r d?	ŋ [n]	ŋk ~ ŋ	mt ~ md?	nt ~ nd	mt ~ mḍ?	ŋf ~mb
Yenisei / Enets	Ø	r (ð)	ŋ [n]	gg	dd	dd	dd	b
Selkup Samoyed	Ø w	r t	ŋ (γ Ø -k)	ŋk	md	nd	md	mb
Kamassian	Ø	r	j Ø [n]	ŋk ŋg	mn	n	mm	m

APPENDIX:
PROTO-YUKAGHIR PHONOLOGY

According to Nikolaeva (2006:65—66), the Proto-Yukaghir consonant system is to be reconstructed as follows (Nikolaeva's transcription has been retained):

	Labial	Dental	Palatal	Velar and Uvular
Stops	p	t		k/q
Affricates		č	č′	
Sibilants		s	(ś)	
Fricatives		δ	(δ′)	γ
Nasals	m	n	ń	ŋ
Laterals		l	l′	
Trills		r		
Approximants	w		j	

Nikolaeva (2006:66) notes that there were no voiced obstruents in Proto-Yukaghir. They developed in the modern languages either from fricatives or from consonant clusters. They are also found in borrowings.

Nikolaeva (2006:57) reconstructs the following vowels for Proto-Yukaghir:

Front vowels	i	e	ö	(ü)
Back vowels	y	a	o	u

Notes:
1. The front vowels exhibited vowel harmony.
2. Nikolaeva (2006:65—66) also posits long vowels for Proto-Yukaghir.

According to Nikolaeva (2006:74—78), Proto-Yukaghir had two types of non-derived monosyllabic nominal stems, both of which contained a long vowel: (1) **(C)V:C* and (2) **(C)V:*, while **(C)V(C)* was forbidden.

Three types of bisyllabic stems are to be reconstructed for Proto-Yukaghir: (1) **(C)V:Cə*, (2) **(C)VCV*, and (3) **(C)VCCə*. Other types of bisyllabic stems could be formed by adding an additional consonant or consonantal cluster, thus: (1) **(C)V:Cə+C(C)-*, (2) **(C)VCV+C(C)-*, and (3) **(C)VCCə+C(C)-*.

Finally, trisyllabic stems could be formed by adding *-*Cə*, *-*CV:*, or *-*Ci/uC* to bisyllabic stems.

Nikolaeva (2006:71—74) reconstructs a series of potential medial consonant clusters for Proto-Yukaghir of the type "resonant + voiceless obstruent". She notes that not all of them were "present in practice". They are (Nikolaeva's transcription has been retained):

*mt	*nt	*ńt	*ŋt	*lt	*l′t
*mp	*np	*ńp	*ŋp	*lp	*l′p
*mk/q	*nk/q	*ńk/q	*ŋk/q	*lk/q	*l′k/q
*mč	*nč	*ńč	*ŋč	*lč	*l′č
*mč′	*nč′	*ńč′	*ŋč′	*lč′	*l′č′

CHAPTER NINE

A SKETCH OF PROTO-DRAVIDIAN PHONOLOGY

9.1. INTRODUCTION

Even though the Dravidian languages are most likely related to Elamite (cf. McAlpin 1974a, 1974b, and 1981; Ruhlen 1987:140 and 330), which together form a larger grouping called Elamo-Dravidian, this chapter will concentrate primarily on Dravidian. Elamite phonology is discussed briefly in §9.6 below.

Several scholars have attempted to relate Dravidian with other language families. Edwin Norris (in 1853), Georg Hüsing (in 1910), Alfredo Trombetti (in 1913), Ferdinand Bork (in 1925), and Igor M. Diakonoff (in 1967), respectively, made early attempts to show that Dravidian might be related to Elamite. The most serious, and the most convincing, attempt along these lines has been the work of David McAlpin (in 1974 and 1981). On the other hand, Rasmus Rask, Robert Caldwell, Otto Schrader, Thomas Burrow, Stephen Tyler, and Elli Johanna Pudas Marlow explored the possibility of a relationship between Dravidian and Uralic. Attempts to relate Dravidian to Nilo-Saharan and to Japanese have not proved fruitful.

Dravidian phonology has been studied in detail by Andronov (2003), Zvelebil (1970), Krishnamurti (2003), and Subrahmanyam (1983), among others, and is fairly well understood. Tamil is the most conservative modern Dravidian language.

9.2. CONSONANTS

Word initially, there were only voiceless stops in Proto-Dravidian. This is still the situation found in Tamil. On the basis of the reflexes found in South Dravidian languages and Telugu, a series of alveolars distinct from dentals and retroflexes has been reconstructed for Proto-Dravidian. A notable feature of Proto-Dravidian consonantism is the absence of sibilants. Medially, Proto-Dravidian had a contrast between geminated (including clusters of nasal plus consonant) and non-geminated consonants. Initially and medially in combination with other stops, **p*, **t*, **k*, and **c* were voiceless; between vowels and before nasals, they were voiced. The geminates were voiceless.

The reconstruction shown below is close to that set up by Zvelebil (1970:77) and Krishnamurti (2003:91 and 120) for Proto-Dravidian; however, I have followed Burrow—Emeneau (1984:xii—xiii), Steever (1998a:14), and McAlpin (1981:24) in the representation of the alveolar as **r̲* instead of **t̲*. The reason for my decision to represent the Proto-Dravidian phoneme as **r̲* instead of **t̲* is based upon the observation that this phoneme corresponds to /r/ in the closely-related Elamite

(though there is some room for interpretation here) as well as in the other Nostratic languages.

Proto-Dravidian had the following consonants (cf. Krishnamurti 2003:91 and 120; Andronov 2003:300; McAlpin 1974a:93 and 1981:25; Steever 1998a:13—18; Subrahmanyam 1983:40; Zvelebil 1970:77 and 1990:1—13):

p-	t-			c-	k-
-p-	-t-	-r̲-	-ṭ-	-c-	-k-
-pp-	-tt-	-rr̲-	-ṭṭ-	-cc-	-kk-
-mp-	-nt-	-nr̲-	-ṇṭ-	-ñc-	-ṅk-
-p(u)	-t(u)	-r̲(u)	-ṭ(u)	-c(u)	-k(u)
m	n		ṇ	ñ	
-mm-	-nn-		-ṇṇ-	-ññ-	
v-	-r	-l	-r̲	y	
-v-	-r-	-l-	-r̲-	-y-	
			-l̤		
			-l̤-		
-vv-	-ll-		-l̤l̤-	-yy-	
(-v)					

Several scholars (Krishnamurti, Meile, Burrow) have also reconstructed Proto-Dravidian **H* (cf. Zvelebil 1990:11—12; Krishnamurti 2003:154—157).

Among the most important consonantal developments are the loss of **c*-, a typical South Dravidian development that seems to be still in progress; the change of **c*- to *k*- before *u* in North Dravidian; the palatalization of **k*- to *c*- before front vowels in Tamil, Malayalam, and Telugu; and the replacement of **k*- by *x* before *a*, *o*, and *u* in North Dravidian. The voiced retroflex continuant **r̲* (Krishnamurti writes **z̲*) has been preserved only in the old stages of the cultivated languages and partly in modern Tamil and Malayalam — elsewhere, it merged with *l̤*, *ḍ*, and other sounds. Some languages, notably Kannaḍa, have developed a secondary *h*-, not inherited from Proto-Dravidian. Cf. Zvelebil 1970:76—167 for details.

As shown by Kumaraswami Raja, clusters involving a homorganic nasal plus stop, **NC*, and a homorganic nasal plus geminate, **NCC*, are to be reconstructed for Proto-Dravidian. None of the daughter languages maintains **NCC* as such. In Tamil, for example, **NC* is preserved, while **NCC* has become **CC*, resulting in numerous *NC* ~ *CC* alternations.

There is sometimes a phonological alternation in the Dravidian daughter languages between medial *-c-* and *-y-*. Comparison with other Nostratic languages indicates that we are dealing with original **-d^{y}-*, **-t^{yh}-*, **-t'^{y}-*, or **-s^{y}-* in such cases. This can be illustrated by the following examples involving **-s^{y}-*:

1. Proto-Nostratic root **p^{h}as^{y}-* (~ **p^{h}əs^{y}-*):
   (vb.) **p^{h}as^{y}-* 'to split, to cleave, to break, to shatter';
   (n.) **p^{h}as^{y}-a* 'split, break; part, share, portion'

A. Proto-Dravidian **pă(y)-/*pac-* ‘to divide, to separate, to distribute’: Tamil *payal* ‘half, share’; Kannaḍa *pañcu*, *pasu* (*pacc-*) ‘to divide, to separate, to part, to distribute, to share; to be divided, etc.’, *pacci*, *paccu* ‘part, portion’, *pasuge* ‘dividing, separation, division’; Tuḷu *pasalu̯* ‘the share of the fisherman’; Telugu *pancu* ‘to distribute, to divide’; Kolami *pay-*, *paiy-* ‘to divide’; Naikṛi *payk-* ‘to distribute’; Parji *payp-* (*payt-*) ‘to share’; Gadba (Salur) *pay-* ‘to divide into shares’, *payp-* (*payup-*) ‘to distribute’; Pengo *paspa* ‘to divide, to distribute’; Kui *pahpa* (*paht-*) ‘to share, to apportion’, *pahaṛi* ‘part, share, portion’. Tuḷu *pāpaṭè* ‘parting of the hair on a female’s forehead’; Telugu *pāyu* ‘to separate (intr.), to leave, to quit, to be disentangled’, *pācu* ‘to remove’, *pāpu* ‘to separate (tr.), to divide, to part, to remove, to efface’, *pāya* ‘branch, division, clove or division of garlic’, *pāpaṭa* ‘the parting of the hair’; Kolami *pa·p-* (*pa·pt-*) ‘to comb’; Naikṛi *pāp-* ‘to comb’; Gondi *pāyā* ‘parting of the hair’; Konḍa *pāy-* ‘to leave, to be gone’. Burrow—Emeneau 1984:363, no. 4089.

B. Afrasian: Proto-Semitic **pas^{y}-ax-* ‘to tear, to render asunder, to sever’ > Hebrew *pāšaḥ* [פָּשַׁח] ‘to tear to pieces’; Syriac *pəšaḥ* ‘to tear, to rend asunder, to cut off’; Arabic *fasaḫa* ‘to dislocate, to disjoint, to sever, to sunder, to tear’. Klein 1987:534. Proto-Semitic **pas^{y}-at’-* ‘to tear off, to strip off’ > Hebrew *pāšaṭ* [פָּשַׁט] ‘to strip off’; Syriac *pəšaṭ* ‘to stretch out, to extend, to reach out’; Akkadian *pašāṭu* ‘to expunge, to obliterate’. Klein 1987:534.

C. Proto-Kartvelian **pešk-* (‘to burst, to break’ >) ‘to explode (noisily)’: Georgian *piš-* in (reduplicated) *piš-piš-i* ‘popping noise made when broth or porridge is brought to a boil’; Mingrelian *pašk-*, *pešk-* ‘to explode (noisily)’; Svan *pišg-/pšg-* ‘to explode (noisily)’. Klimov 1964:188—189 **peš-* and 1998:201 **peš-* : **pš-* ‘to dehisce (noisily, with a crack)’; Fähnrich—Sardshweladse 1995:356—357 **peš-/*piš-*; Fähnrich 2007:435 **peš-/*piš-*. For the semantics, cf. Gurage *färäṭä* ‘to burst, to burst and make the sound of bursting, to explode’ from the same root found in Hebrew *pāraṣ* ‘to break through, to break, to burst’, Arabic *faraṣa* ‘to cut, to split, to tear, to injure’, Akkadian *parāṣu* ‘to break through’, etc.

D. Proto-Uralic **pas^{y}з-* ‘to break, to shatter; to tear, to split’: Votyak / Udmurt *paś* ‘hole, opening’; Zyrian / Komi *paś* in *paś mun-* ‘to shatter into fragments, to fall and scatter, to fall and shatter’, *paś vart-* ‘to beat into small bits, to crush to pieces’; Selkup Samoyed *paase*, *pas* ‘fissure, tear, break’; Kamassian *buzoj* ‘a crack, crack in the floor, tear’, *puzoj* ‘cleft, tear’. Collinder 1955:47 and 1977:65; Rédei 1986—1988:357—358 **paśз*; Décsy 1990:105 **pasja* ‘hole, opening’.

Sumerian *peš$_5$* ‘to break, to smash, to shatter’.

2. Proto-Nostratic root **mus^{y}-* (~ **mos^{y}-*):
(vb.) **mus^{y}-* ‘to immerse, dip, or plunge in water, to bathe’;
(n.) **mus^{y}-a* ‘immersion, dip, plunge, bath’

Extended form (Indo-European and Uralic):
(vb.) **mus^{y}-V-k'-* ‘to immerse, dip, or plunge in water, to bathe’;
(n.) **mus^{y}-k'-a* ‘immersion, dip, plunge, bath’

A. Proto-Dravidian **muy-/*muc-* > **mī(y)-/*muc-* ‘to wash, to bathe’: Toda *mi·y-* ‘to bathe’; Kannaḍa *mī*, *mīyu* ‘to take a bath, to bathe; to cause to bathe, to wash, to pour over (the body)’; Tuḷu *mīpini* ‘to take a bath, to wash oneself’; Parji *mī-* ‘to bathe’; Gadba (Ollari) (*nīr*) *muy-*, (Salur) *mī-*, *miy-* ‘to bathe’; Manḍa *mī-* ‘to bathe’; Gondi *mīy-*, *mī-* ‘to wash someone else’s body, especially infants’, *micnā* ‘to bathe another’; Kui *mīva* ‘to lave, to bathe or anoint oneself, to be anointed or spattered’, *musa* (*musi-*) ‘to wash the head’; Kuṛux *mūjnā* ‘to wash the face of’; Malto *múnje* ‘to wash another’s face’, *múnjre* ‘to wash one’s face’. Burrow—Emeneau 1984:435, no. 4878.
B. Proto-Indo-European **mosk'-* (secondary *e*-grade form: **mesk'-*) ‘to immerse in water, to dip or plunge in water’: Sanskrit *májjati* ‘to sink, to dive, to plunge, to perish’; Latin *mergō* ‘to dip, to plunge in liquid, to immerse’; Lithuanian *mazgóti* ‘to wash, to wash up, to scrub’; Latvian *mazgât* ‘to wash’. Rix 1998a:398 **mesg-* ‘to dip, to plunge into liquid, to immerse, to sink’; Pokorny 1959:745—746 **mezg-* ‘to dip, to plunge’; Walde 1927—1932.II:300—301 **mezg-*; Mann 1984—1987:761 **mesgō* (**mezg-*) ‘to immerse, to soak, to steep; to plunge’, 800 **mosgos* (**mosg-*) ‘steeping, infusion, mash’; Mallory—Adams 1997:160 **mesg-* ‘to dip under water, to dive’; Watkins 1985:42 **mezg-* and 2000:56 **mezg-* ‘to dip, to plunge’; Mayrhofer 1956—1980.II:549; Walde—Hofmann 1965—1972.II:76—77 Latin *mergō* < **mezgō*; Ernout—Meillet 1979:399 **mezg-*.
C. Proto-Uralic **mus^{y}ke-* (**mos^{y}ke-*) ‘to wash’: Estonian *mõske-* ‘to wash’; Mordvin *muśke-* ‘to wash’; Cheremis / Mari *muška-* ‘to wash’; Yurak Samoyed / Nenets *maasa-* ‘to wash’; Yenisei Samoyed / Enets *masua-* ‘to wash’; Selkup Samoyed *musa-* ‘to wash’. Collinder 1955:35, 1965:31, and 1977:54; Joki 1973:286—287; Rédei 1986—1988:289 **muśke-* (**mośke-*); Décsy 1990:103 **mosjka* ‘to wash’; Sammallahti 1988:538 **mośki-* ‘to wash’.

9.3. VOWELS

Proto-Dravidian had five short vowels and five long vowels plus the sequences **ay* and **av* (< **aw*) (cf. McAlpin 1981:23—24; Subrahmanyam 1983:36; Zvelebil 1970:35 and 1990:6; Krishnamurti 2003:91; Burrow—Emeneau 1984:xii—xiii; Steever 1998a:13—14; Andronov 2003:26—27):

e	o	a	i	u
ē	ō	ā	ī	ū

A notable characteristic of South Dravidian is the neutralization of **i* and **e* to **e* and of **u* and **o* to **o* before a derivative **a* in Proto-South Dravidian. This patterning is preserved in Telugu and Kannaḍa, while **e* and **o* were later assimilated back into **i* and **u* respectively in Tamil and Malayalam. The full range of developments in the individual South Dravidian languages is rather complicated (cf. Zvelebil 1970:35—75 and Krishnamurti 2003:98—119 for details).

9.4. ACCENTUATION

Primary stress always falls on the first, that is, the root syllable and is not phonemically distinctive in Dravidian. On the other hand, intonation plays an important role. For details, cf. Zvelebil 1970:40—41, Steever 1998a:18, and Krishnamurti 2003:59—60.

9.5. ROOT STRUCTURE PATTERNING

Morphologically, the Dravidian languages are agglutinating (cf. Zvelebil 1977:3; Steever 1998a:18). Derivational morphology is exclusively suffixal (cf. Steever 1998a:18; Zvelebil 1990:16—17). The basic root type was monosyllabic, though there is some indication that an extremely small number of bisyllabic roots may have to be reconstructed at the Proto-Dravidian level as well. This is, however, by no means certain (Krishnamurti 2003:179 denies it emphatically), and it is best at present to regard Proto-Dravidian roots as exclusively monosyllabic. Inflectional categorization was achieved by means of suffixes added directly to the lexical roots or to the lexical roots extended by means of derivational suffixes. Any vowel, long or short, could appear in a root, but only **a*, **i*, and **u* could appear in a suffix.

The following root types may be assumed to have existed in Proto-Dravidian (cf. Subrahmanyam 1983:13—35; Zvelebil 1990:11—15; Krishnamurti 2003:90—93; Andronov 2003:101—102):

A. **V-* and **CV-*
B. **V̄-* and **CV̄-*
C. **VC-* and **CVC-*
D. **V̄C-* and **CV̄C-*
E. **VCC-* and **CVCC-*
F. **V̄CC-* and **CV̄CC-*

**V-* and **CV-* almost always occurred with a derivational suffix; **V̄-* and **CV̄-* could occur both with and without a derivational suffix; **VCC-* and **CVCC-* could occur both with and without a derivational suffix in bisyllabic nominal stems, while in verbal stems, they always occurred without a suffix — they alternated with **VC-* and **CVC-* before a derivational suffix in verbal stems and trisyllabic nominal stems; **V̄CC-* and **CV̄CC-* could occur both with and without a derivational suffix

in bisyllabic nominal stems, but in verbal stems, they always occurred without a suffix.

Roots ending in a vowel were followed by derivational suffixes beginning with a consonant, while roots ending in a consonant could be followed by derivational suffixes beginning with either a consonant or a vowel, though those beginning with a vowel were by far the most common type. Derivational suffixes beginning with a vowel could consist of (A) the simple vowel itself (*-*V*-), (B) the vowel plus a single consonant (*-*VC*-), (C) the vowel plus a geminate stop (*-*VCC*-), (D) the vowel plus the sequence of nasal and its corresponding homorganic stop (*-*VNC*-), or (E) the vowel plus the sequence of a nasal and its corresponding homorganic geminate stop (*-*VNCC*-). In primary nominal stems, the derivational suffix *-*VCC*- could be further extended by adding another suffix of the type *-*VC*-. The derivational suffixes probably originally modified the meaning in some way, though, as noted by Caldwell (1913:209), it is no longer possible, in most cases, to discern their original meaning.

There were three fundamental form-classes in Proto-Dravidian (cf. Zvelebil 1977:6): (A) nominal, adjectival, and pronominal stems, (B) verbal stem, and (C) indeclinables.

9.6. ELAMITE PHONOLOGY

The Elamite phonological system was fairly simple (cf. Grillot-Susini 1987:10—11; Khačikjan 1998:6—9; Paper 1955:36; Reiner 1969:71—75; Stolper 2004:70—73):

Consonants:

p		t		k	
b		d		g	
		s	š		
		z			
	v/f (?)			h	
m		n			
l		r			

Vowels:	i	e	a	u	(o ?)

Note: Vowel length was not phonemic.

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The Dravidian sound correspondences on the following pages are from Burrow—Emeneau 1964:xii—xiii; Krishnamurti 2003:90—178; Zvelebil 1970; Andronov 2003:65—101; Subrahmanyam 1983.

9.7. CORRESPONDENCES

VOWELS

Proto-Dravidian	*a	*e	*i	*o	*u	*ā	*ē	*	*ō	*ū
Tamil	a	e	i	o	u	ā	ē	ī	ō	ū
Malayalam	a	e	i	o	u, ə	ā	ē	ī	ō	ū
Kota	a	e	i	o	u	ā	ē	ī	ō	ū
Toda	o, a	ö, e	ï, i	wa, wï, o, ï	wī, wa, u	ō, ā	ӧ̄, ē	ī	wā, wï̄, ī	ū
Kannaḍa	a	e	i	o	u	ā	ē	ī	ō	ū
Koḍagu	a	e, ë	i	o	u	ā	ē, ë̄	ī	ō	ū
Tuḷu	a	e	i	o	u	ā	ē	ī	ō	ū
Telugu	a	e	i	o	u	ā	ē	ī	ō	ū
Kolami	a	e	i	o	u	ā	ē	ī	ō	ū
Naikṛi	a	e	i	o	u	ā	ē	ī	ō	ū
Naiki (of Chanda)	a	e	i	o	u	ā	ē	ī	ō	ū
Parji	e, a	e, a	i	o	u	ē, ā	ē, ā	ī	ō	ū
Gadba (Ollari)	a	e	i	o	u	ā	ē	ī	ō	ū
Gadba (Salur)	a	e	i	o	u	ā	ē	ī	ō	ū
Gondi	a	e, a	i	o, u	u	ā	ē	ī	ō	ū
Konḍa	a	e	i	o	u	ā	ē	ī	ō	ū
Pengo	a	e	i	o	u	ā	ē	ī	ō	ū
Manḍa	a	e	i	o	u	ā	ē	ī	ō	ū
Kui	a	e	i	o	u	ā	ē	ī	ō	ū
Kuwi	a	e	i	o	u	ā	ē	ī	ō	ū
Kuṛux	a	e	i	o	u	ā	ē	ī	ō	ū
Malto	a	e	i	o	u	ā	ē	ī	ō	ū
Brahui	a	a, i	i	ō, u, a	u	ā	ē	ī	ō	ū

CONSONANTS

Proto-Dravidian	*k-	*-k-	*kk	*ṅk	*c-	*-c-	*cc	*ñc
Tamil	k, c	k	kk	ṅk	c	c, y	cc	ñc
Malayalam	k, c	k	kk	ṅṅ	c	c, y	cc	ññ
Kota	k	g	k	g, ŋg	c	c	c	nj
Toda	k	x	k	g, x	t	s	c (= t̲s̲)	z (= d̲z̲)
Kannaḍa	k	g	kk, k	g, ṅg	s, c	s	cc, s	j, ñj
Koḍagu	k	g	kk, k	ŋg	c	j	cc	ñj
Tuḷu	k	g	kk, k	ṅg	c, s, ś, t, h	j	cc	ñj
Telugu	k, c	g	kk, k	ṅg	c	c, s	cc, c	nj
Kolami	k	g	k	ŋg	s	s	cc, c	nj
Naiki (of Chanda)	k	g	k	ŋg, ŋ	s	s	cc	nj
Parji	k	g, v, y	k	ŋg, ŋ	c	y	cc	ñ, ñj
Gadba (Ollari)	k	g	k	ŋg, ŋ	s, c	y	cc	ñ, ñj
Gondi	k	y	k	ng	s, h, Ø	s	s	nj
Konḍa	k	g	k	ŋ	s	z	s	nj
Pengo	k	g	k	ŋ(g)	h	z	c	nj
Manḍa	k	g	k	ŋ(g)	h	h	c	nj
Kui	k	g	k	ng	s	s, h	s	nj
Kuwi	k	y	k	ng	h	h	cc, c	nj
Kuṛux	x, k	x	k, (k) kh	ŋx, ŋg	c	s	cc, c	ńj
Malto	q, k	ġ	q, k	nq, n̲g̲	c	s	c	nj
Brahui	x, k	x	kk	ng	c	s	s	

Proto-Dravidian	*-ṭ-	*ṭṭ	*ṇṭ	*t-	*-t-	*tt	*nt
Tamil	ṭ	ṭṭ	ṇṭ	t	t	tt	nt
Malayalam	ṭ	ṭṭ	ṇṭ	t	t	tt	nn
Kota	ṛ	ṭ	ḍ, ṇḍ	t	d	t	d, nd
Toda	ṛ	ṭ	ḍ	t	Ø	t	d, Ø
Kannaḍa	ḍ	ṭṭ, ṭ	ḍ, ṇḍ	t	d	tt, t	d, nd
Koḍagu	ḍ	ṭṭ, ṭ	ṇḍ	t	d	tt, t	nd
Tuḷu	ḍ	ṭṭ, ṭ	ṇḍ	t	d	tt, t	nd
Telugu	ḍ	ṭṭ, ṭ	ṇḍ	t	d	tt, t	nd
Kolami	ḍ	ṭṭ, ṭ	ṇḍ	t	d	t	nd
Naiki (of Chanda)	ṛ	ṭṭ, ṭ	ṇḍ	t	d	tt, t	nd
Parji	ḍ	ṭṭ, ṭ	ṇḍ	t	d	tt, t	nd, d
Gadba (Ollari)	r	ṭṭ, ṭ	ṇḍ	t	d	t	nd, d
Gondi	r̲, ṛ, r, rr	ṭṭ, ṭ	ṇḍ	t	d	tt	nd
Konḍa	r̲	ṭṭ, ṭ	ṇḍ	t	d	t	nd
Pengo	z	ṭ	ṇḍ	t	d	t	nd
Manḍa	y	ṭ	ṇḍ	t	d	t	nd
Kui	j, g	ṭ	nḍ, ḍ	t	d	t	nd
Kuwi	y, r	ṭṭ, ṭ	ṇḍ	t	d	tt, t	nd
Kuṛux	ṛ	ṭṭ, ṭ	ṇḍ	t	d	tt, t	nd
Malto	ṛ	ṭ	ṇḍ	t	th	t	nd
Brahui	r, rr, ṛ	ṭ	ṇḍ	t	d	t, tt	

Proto-Dravidian	*p-	*pp	*mp	*-r̲-	*r̲r̲	*n̲r̲	*m
Tamil	p	pp	mp	r̲	r̲r̲	n̲r̲	m
Malayalam	p	pp	mp	r̲	r̲r̲	n̲n̲	m
Kota	p	p	b, mp	r̲	t̲	d̲, nd̲	m
Toda	p	p	b	r̲	t̲	d̲	m
Kannaḍa	p > h	pp, p	v, mb	r̲	tt, t	r̲, nd	m
Koḍagu	p	pp, p	mb	r	tt, t	nd	m
Tuḷu	p	pp, p	mb	d, j, r	tt	ñj, j	m
Telugu	p	pp, p	m, mm, mb	r̲	ṯṯ, ṯ	ṉḍ	m
Kolami	p	p	m, mb	d, r	tt, t	nd	m
Naiki (of Chanda)	p	p	m, mb	d, r	tt, t	nd	m
Parji	p	pp, p	m, mb, b	d, r	tt, t	nd	m
Gadba (Ollari)	p	p	m, mb	y	ṯṯ, ṯ	nḍ	m
Gondi	p	p	m	r̲, r, r, rr	tt, t	nd	m
Konḍa	p	p	mb, m	r̲	ʀ	nr̲	m
Pengo	p	p	m	z	c, s	nj	m
Manḍa	p	p	m, mb	y	c	nj	m
Kui	p	pp, p	mb	j, g, (r)	s	nj	m
Kuwi	p	pp, p	m, mb	y, r	c	nj	m
Kuṛux	p	pp, p	mb	r, rr, s	tt, t	nd	m
Malto	p	p	mb	r, s	t	nd	m
Brahui	p	p	mb	r, rr, Ø		s	m, b-

Proto-Dravidian	*n	*n̲ (?)	*ṇ	*y	*r	*l	*ll
Tamil	n	n̲	ṇ	y	r	l	ll
Malayalam	n	n̲	ṇ	y	r	l	ll
Kota	n	n	ṇ	y	r	l	l
Toda	n	n	ṇ	y	r, š, ṣ, Ø	s̲, ɬ, l	s̲, l
Kannaḍa	n	n	ṇ	y	r	l	ll
Koḍagu	n	n	ṇ	y	r	l	ll
Tuḷu	n	n	ṇ, n	y	r	l, r	ll
Telugu	n	n	n	y	r	l	ll
Kolami	n	n	n	y	r	l	ll, l
Naiki (of Chanda)	n	n	n	y	r	l	l, ll
Parji	n	n	n	y	r	l	ll, l
Gadba (Ollari)	n	n	ṇ, n	y	r	l	ll
Gondi	n	n	n	y	r	l	ll, l
Konḍa	n	n	ṇ	y	r	l	l
Pengo	n	n	n, ṇ	y	r	l	l
Manḍa	n	n	n	y	r	l	l
Kui	n	n	n, ṇ	j	r	ḍ̲, l	ḍ̲, l
Kuwi	n	n	n	y	r	l	ll, l
Kuṛux	n	n	n	y	r	l	ll, l
Malto	n	n	n	y	r	l	l
Brahui	n, d-	n	n		r, rr, Ø	l, l̲h	ll

Note: According to Zvelebil (1970:129—130 and 1990:11), only **n* should be reconstructed for Proto-Dravidian, not **n̲*. Zvelebil interprets the [n̲] ~ [n] alternation found in Tamil and Malayalam as "entirely allophonic in distribution".

Proto-Dravidian	*v-	*-v-	*r̲	*l̤	*ll̤
Tamil	v	v	r̲	l̤	ll̤
Malayalam	v	v	r̲	l̤	ll̤
Kota	v	v	l̤, r̲, g, y	l̤	l̤
Toda	p	f	ḍ, r̲, š, ṣ, w, Ø	l̤, ɬ̤	l̤, ɬ̤
Kannaḍa	b	v	r̲ (> l̤, r)	l̤	ll̤
Koḍagu	b	v	l̤, Ø	l̤	ll̤
Tuḷu	b	v, b	r, l̤	l, l̤	ll̤
Telugu	v	v	r̲ (> ḍ, r)	l	ll
Kolami	v	v	r	l	ll
Naiki (of Chanda)	v	v	Ø, y	l, y	ll
Parji	v	v	r̤	l	ll
Gadba (Ollari)	v	v	r̤, ḍ	l	ll
Gondi	v, w	v, w	r̤, r	r̤	ll, l
Konḍa	v	v	r̤	r̤, l	l
Pengo	v	v	r̤	r̤	r̤
Manḍa	v	v	r̤	r̤	l
Kui	v	v	r̤	ḍ, l	ḍ, l
Kuwi	b	v	r̤	r̤	l
Kuṛux	b	b, v	Ø, r̤, y, l	l	ll
Malto	b	w	Ø, r̤, y, l	l	l
Brahui	b	f, v	r, rr, r̤, l/l̲h̲, Ø	l, l̲h̲	ll

APPENDIX:
SELECTED PHONOLOGICAL SYSTEMS

OLD TAMIL

The phonemic inventory of Old Tamil was extremely conservative. It contained seventeen consonants and ten vowels (cf. Thomas Lehmann 1998:76—78; Steever 2004a:2018; Krishnamurti 2003:62):

Consonants:

	Labial	Dental	Alveolar	Retroflex	Palatal	Velar
Stop	p	t	r̲	ṭ	c	k
Nasal	m	n	n̲	ṇ	ñ	[ṅ]
Lateral		l		ḷ		
Glide	v				y	
Tap			r			
Approx.				r̲		

Notes:
1. /ṅ/ occurs only before /k/.
2. Only the following consonants can occur initially: p, t, c, k; m, n, ñ; v, y.
3. Only the following consonants can occur finally: m, n, n̲, ṇ; l, ḷ; v, y; r, r̲.
4. There is also a fricative /h/ in Old Tamil. It is transcribed as *k̲* and is only found between a short vowel and a stop — for instance, *ak̲tu* ‘it, that’.

Vowels:

	Front		Central		Back	
	Short	Long	Short	Long	Short	Long
High	i	ī			u	ū
Mid	e	ē			o	ō
Low			a	ā		
Diphthongs: ai, au						

MODERN TAMIL

The consonant system of Modern Tamil consists of native elements (p, t, ṭ, c, k, r, m, n, ṇ, ñ, l, ḷ, r̲, ṟ, v, y) and borrowed elements (b, d, ḍ, j, g, f, s, ṣ, h). The borrowed elements are found in loanwords, mostly from Indo-Aryan (including Sanskrit), Persian, Arabic, and English sources. The borrowed elements are shown in parentheses in the following table (cf. Annamalai—Steever 1998:101—104;

Asher 1981:209—241; Krishnamurti 2003:62—63; Ruhlen 1975:274; Schiffman 1999:9—12; Steever 1990:183).

Consonants:

	Labial	Dental	Alveolar	Retroflex	Palatal	Velar	Glottal
Stop: vls.	p	t		ṭ	c	k	
vd.	(b)	(d)		(ḍ)	(j)	(g)	
Fricative	(f)						
Sibilant		(s)		(ṣ)			
Tap		r					
Flap			[r̲]				
Nasal	m	n	[n̲]	ṇ	ñ	[ṅ]	
Lateral		l		ḷ			
Approx.				ṛ			
Glide	v				y		(h)

Notes:
1. The borrowed elements are pronounced as their closest native elements in normal speech. Thus, for example, /faiyal/ ‘file’ is pronounced /paiyal/, with /p/ substituted for /f/.
2. /n/ has three variants: /n/ occurs initially and before /t/; /ṅ/ occurs only before /k/; and /n̲/ occurs in clusters and finally.
3. The following sounds occur in Sanskrit loanwords: /s/, /ṣ/, /j/, /h/.
4. Stops are voiced after homorganic nasals and between vowels.
5. /r̲/ can also be transcribed /ẓ/.
6. Except for /r/ and /r̲/, all consonants can occur doubled.

Vowels:

	Front		Central		Back	
	Short	Long	Short	Long	Short	Long
High	i	ī			u	ū
Mid	e	ē	(ʌ)		o	ō
Low		(ǣ)	a	ā		
Diphthongs: ai, au						

Krishnamurti (2003:61—77) lists the phonemic inventories of the various Modern Dravidian languages — Old and Modern Tamil are discussed on pp. 62—63, while Malayalam is discussed on p. 63, Kannaḍa on pp. 66—67, and Telugu on pp. 68—69.

MODERN STANDARD KANNAḌA

Modern Standard Kannaḍa has a larger phonemic inventory than Modern Tamil. There are eleven vowels and thirty-four consonants (cf. Steever 1998b:130—131; Krishnamurti 2003:66—67). The consonant inventory consists of four series of stops and affricates based upon voicing and aspiration contrasts: (1) plain (unaspirated) voiceless (p, t, ṭ, c, k); (2) voiceless aspirated (ph, th, ṭh, ch, kh); (3) plain voiced (b, d, ḍ, j, g); and (4) voiced aspirated (bh, dh, ḍh, jh, gh). There are also: a series of fricatives (voiceless: f, s, ṣ, ṣ, h; voiced: z); three nasals (m, n, ṇ); two laterals (l, ḷ); two glides (v, y); and a tap (r). The following sounds can only occur in loanwords: /ǣ/, /f/, /z/. Likewise, both the voiceless aspirates (ph, th, ṭh, ch, kh) and the voiced aspirates (bh, dh, ḍh, jh, gh) only occur in loanwords, mainly in those borrowed from Sanskrit. In rapid speech and in some dialects of Kannaḍa, these sounds are pronounced as their plain (unaspirated) counterparts. The borrowed elements are shown in parentheses in the following table.

Consonants:

	Labial	Dental	Retroflex	Palatal	Velar
Stop: vls.	p	t	ṭ	c	k
vls. asp.	(ph)	(th)	(ṭh)	(ch)	(kh)
vd.	b	d	ḍ	j	g
vd. asp.	(bh)	(dh)	(ḍh)	(jh)	(gh)
Fricative: vls.	(f)	s	ṣ	ś	h
vd.		(z)			
Nasal	m	n	ṇ		
Lateral		l	ḷ		
Glide	v			y	
Tap		r			

Vowels:

	Front		Central		Back	
	Short	Long	Short	Long	Short	Long
High	i	ī			u	ū
Mid	e	ē			o	ō
Low		(ǣ)	a	ā		

Notes:

1. Proto-Dravidian */r̥/ > /ḷ/ between vowels but /ḷ/ or /r/ before consonants in Kannaḍa (cf. Andronov 2003:55). *r̥/ only occurred in medial and final positions in Proto-Dravidian.

2. Initial /p-/ of Classical Kannaḍa has become /h-/ in Modern Standard Kannaḍa, though there are many exceptions in which /p/ has been retained (cf. Andronov 2003:54).

MODERN STANDARD TELUGU

The phonemic inventory of Modern Standard Telugu is similar to that of Modern Standard Kannaḍa (cf. Krishnamurti 1998:206—207 and 2003:68—69). Like other Dravidian languages, Telugu has a substantial number of loanwords from Indo-Aryan and other languages, including Persian, Arabic, and English, and this has resulted in the addition of several non-native elements to the phonemic inventory — the aspirated consonants and the sibilants /ṣ/ and /ś/, for example, were introduced at an early date through Sanskrit and Prakrit loanwords.

Consonants:

	Labial	Dental-Alveolar	Retroflex	Palatal	Velar
Stop: vls.	p	t	ṭ	c	k
vls. asp.	ph	(th)	ṭh	ch	kh
vd.	b	d	ḍ	j	g
vd. asp.	bh	dh	ḍh	jh	gh
Fricative	f	s	ṣ	ś	h
Nasal	m	n	ṇ		
Lateral		l	ḷ		
Semivowel	w			y	
Flap		r			

Vowels:

	Front		Central		Back	
	Short	Long	Short	Long	Short	Long
High	i	ī			u	ū
Mid	e	ē			o	ō
Low		ǣ	a	ā		

Notes:
1. In Standard Telugu, /th/ tends to merge with /dh/ except after /s/.
2. In non-standard Telugu, the aspirated consonants are replaced by their plain (unaspirated) counterparts, /ś/ and /ṣ/ are replaced by /s/, and /f/ is replaced by /p/.

CHAPTER TEN

A SKETCH OF PROTO-ALTAIC PHONOLOGY

10.1. INTRODUCTION

As noted by Merritt Ruhlen (1987:128):

> The study of the Altaic family has had a long and stormy history, and even today there is considerable disagreement among specialists over exactly which languages belong to the family.

The similarities among what has come to be known as the "Altaic" languages (specifically, Chuvash-Turkic, Mongolian, and Manchu-Tungus) were recognized nearly three hundred years ago by the Swedish military officer Johann von Strahlenberg, who published a work on the subject in 1730 (though Strahlenberg actually rejected the idea of a genetic relationship among these languages). The famous Danish scholar, and one of the founders of Indo-European comparative grammar, Rasmus Rask, also conducted research into these languages as well as Eskimo, several Uralic languages, and what have sometimes been called the "Paleosiberian" languages. In the middle of the last century, important work was done by the Finnish linguist Matthew Alexander Castrén. It was another Finnish scholar, Gustav John Ramstedt (cf. Poppe [1965:83—85] for a sketch of Ramstedt's life), who really put Altaic comparative linguistics on a firm footing. Ramstedt published many important studies, culminating in the posthumous publication (1952—1957) of his two-volume (in English translation) *Introduction to Altaic Linguistics*. A few of the many scholars who have made significant contributions to Altaic linguistics are: Pentti Aalto, Johannes Benzing, Anna Dybo, Joseph Grunzel, Erich Haenisch, Shiro Hattori, Wladyslaw Kotwicz, Samuel E. Martin, Karl H. Menges, Roy Andrew Miller, Antoine Mostaert, Oleg Mudrak, Gyula (Julius) Németh, Jerry Norman, Martti Räsänen, Martine Robbeets, András Róna-Tas, Andrew Rudnev, Aurélien Sauvageot, Boris A. Serebrennikov, Denis Sinor, Sergej A. Starostin, John C. Street, Vilhelm Thomsen, Vera Ivanovna Tsintsius (Cincius), Ármin Vámbéry, Boris Yakovlevich Vladimirtsov, Alexander Vovin, and others too numerous to count, including several Russian, Korean, and Japanese scholars. One of the most prominent Altaic scholars of the twentieth century was the Russian-born Nicholas Poppe, who published numerous books and articles, including (in English translation) *Khalkha-Mongolian Grammar* (1951), *Introduction to Mongolian Comparative Studies* (1955; reprinted 1987), (in English translation) *Comparative Grammar of the Altaic Languages* (1960; only Part I appeared), *Introduction to Altaic Linguistics* (1965), and *Grammar of Written Mongolian* (third printing 1974). A noteworthy work (1991) is the monograph by the late Russian linguist

Sergej Starostin entitled (in English translation) *The Altaic Problem and the Origin of the Japanese Language*. Finally, we may note in passing that Illič-Svityč (1963, 1964b) also made a couple of important contributions to Altaic linguistics.

Traditionally, Altaic has included the core groups (Chuvash-)Turkic, Mongolian, and (Manchu-)Tungus, to which some have tried to add Korean, Japanese-Ryukyuan (Japonic), and Ainu. Looking at just the core group, one is hard-pressed to find features common to all three. There are, to be sure, common features between (Chuvash-)Turkic and Mongolian on the one hand and between Mongolian and (Manchu-)Tungus on the other, but there appear to be relatively few features common to (Chuvash-)Turkic and (Manchu-)Tungus alone. All three are, in fact, similar in structure, but this has been considered by some to be strictly a typological characteristic. The common features found among the members of the core group have been explained as due to diffusion, and, for a good portion of the common lexical material, this seems to be a valid explanation (cf. Poppe 1965:157—163). There are, however, features common (pronouns, to cite a single example) to the members of the core group as a whole that cannot be explained as due to diffusion, and which do indeed point to some sort of genetic relationship. The problem is in trying to define the nature of that relationship. Two explanations are possible: (1) The shared features are due to common descent from Proto-Nostratic and do not imply a closer relationship between the three. In this scenario, (Chuvash-)Turkic, Mongolian, and (Manchu-)Tungus turn out to be three independent branches of Nostratic — this is Dolgopolsky's view. (2) The shared features are due to descent from a common Altaic parent language intermediate between Proto-Nostratic and each of the core group members. The trouble with the first explanation is that it merely shifts the question back to the Nostratic level without resolving a thing, whereas the second explanation keeps the focus exactly where it belongs. The second alternative thus remains a viable working hypothesis.

Strong opposition to the Altaic Theory has been expressed by several reputable scholars, perhaps the most vocal being Gerhard Doerfer and Gerard Clauson. At the Workshop on Linguistic Change and Reconstruction Methodology held at Stanford University from 28 July through 1 August 1987, the consensus of the Altaic panel was that "[i]n short, we found Proto-Altaic, at best, a premature hypothesis and a pragmatically poor foundation on which to build a sustained research program" (cf. Unger 1990:479).

The whole question of Altaic unity was again reexamined by Roy Andrew Miller (1991). Miller addresses and convincingly demolishes objections that have been raised by those opposed to setting up an Altaic language family, and he concludes his paper by listing a number of important tasks that must be undertaken by Altaicists to redirect "Altaic historical-linguistic studies back into the mainstream of comparative linguistics". Another who defended the Altaic Theory against its critics was the Hungarian linguist Lajos Ligeti. In a 1969 article entitled "A Lexicostatistical Appraisal of the Altaic Theory", Ligeti reevaluated the evidence for and against the Altaic Theory, concentrating particularly on the views of Clauson. Ligeti concluded that the evidence does indeed point to a genetic

relationship among (Chuvash-)Turkic, Mongolian, and (Manchu-)Tungus. Poppe (1965:125—156) also discusses the history of the Altaic Theory and confronts the issues raised by the critics. Sergej Starostin (1991) attempts to clarify many of the issues surrounding the problems associated with setting up an Altaic language family, including the relationship of Korean and Japanese to the other Altaic language groups (but see the rather critical reviews of Starostin's work by Comrie 1993, Krippes 1994, and Vovin 2001:107—114). One of the more recent works in support of the Altaic Theory is the massive *An Etymological Dictionary of the Altaic Languages* (2003) by Sergej Starostin, Anna Dybo, and Oleg Mudrak (see below). Greenberg (2005g) also considers Altaic to be a valid genetic grouping.

The question of genetic relationship (or lack thereof) can only be definitively resolved when each branch has been fully reconstructed in all aspects (phonology, morphology, and vocabulary) and when the issue of diffusion has been reasonably clarified — indeed, good progress has been made and continues to be made in both of these areas (cf. Robbeets 2005 and subsequent works). At that time, a meaningful comparison can be made between the putative daughter languages.

I would tentatively include the following groups within the Altaic language family: (Chuvash-)Turkic, Mongolian, (Manchu-)Tungus, and possibly Korean, while Japanese-Ryukyuan (Japonic) appears to be made up of an Altaic element that has been superimposed on an Austronesian substratum (cf. Robbeets 2017). The shared features between (Chuvash-)Turkic, Mongolian, and (Manchu-)Tungus may be looked upon as due to common descent from an Altaic parent language. Language change over time has gradually led to increasing differentiation between each of the three core group members, while diffusion, especially lexical diffusion, has tended to complicate the picture and has made it difficult to differentiate between that which is borrowed and that which is inherited.

Probably the most notable characteristic of the Altaic languages is the assimilatory phenomenon known as "vowel harmony". In the Turkic languages, for example, the first vowel segment occurring in a word influences the following vowel segments so that all vowels in the word have certain features in common. In Kirghiz, all of the vowels occurring in a given word must have the same feature for front ~ back and for rounded ~ unrounded, while height distinctions do not figure into the system of vowel harmony at all, so that high and non-high vowels can be freely combined in a word. It was the development of the system of vowel harmony that was responsible for the appearance of front rounded and back unrounded vowels in Altaic. These vowels are, thus, a later development and are not to be reconstructed for Proto-Nostratic.

10.2. OLDER VIEWS ON THE RECONSTRUCTION OF THE PROTO-ALTAIC PHONOLOGICAL SYSTEM

In my 1994 co-authored book (Bomhard—Kerns 1994), I mostly followed the reconstruction of the Proto-Altaic phonological system proposed by Nicholas Poppe (1960), while I based the Proto-Altaic reconstructed forms upon those proposed by

John Street (1974). According to Poppe, Proto-Altaic is assumed to have had a voicing contrast in stops and affricates, but, as he notes (1960:9—10), there is a possibility that the contrast could have been between voiceless aspirated and voiceless unaspirated stops and affricates instead. An entirely different approach is taken by Illič-Svityč (1971—1984.I:147—156), who reconstructs the three-way contrast of (1) voiceless aspirated, (2) plain voiceless, and (3) plain voiced for Proto-Altaic, and this is also the system followed by Sergej Starostin (1991). According to Poppe's reconstruction, neither the liquids nor the velar nasal were used word initially, while the voiceless stops and voiceless palato-alveolar affricate were strongly aspirated. Poppe also assumed that Proto-Altaic had a rich system of long and short vowels.

According to Poppe (1960), the Proto-Altaic phonological system is to be reconstructed as follows (see also Ramstedt 1952—1957; Robbeets 2005):

p	t	č	k
b	d	ǯ	g
	s		
m	n	n^y	-ŋ-
	-r- (= $-r^1-$)	$-r^y-$ (= $-r^2-$)	
	-l- (= $-l^1-$)	$-l^y-$ (= $-l^2-$)	
		y	

a	o	u	i	e	ė	ö	u̇	ï
ā	ō	ū	ī	ē	ė̄	ȫ	u̇̄	ï̄

According to Sergej Starostin (1991:5—24), on the other hand, the Proto-Altaic phonological system is to be reconstructed as follows:

Stops and affricates:	p^h	t^h	$č^h$	k^h
	p	t	č	k
	b	d	ǯ	g
Sibilants:		s	š (?)	
		z (?)		
Nasals and liquids:	m	n	n^y	ŋ
		-l- (= $-l^1-$)	$-l^y-$ (= $-l^2-$)	
		-r- (= $-r^1-$)	$-r^y-$ (= $-r^2-$)	
Glides:	-w-		-y-	

Vowels:	i	e	ä	ü	ö	ɨ (ə) (?)	u	o	a
Diphthongs:			ia	io	iu (ue?)	ua			

Note: Though not shown in the charts on pages 21—24 of his 1991 book, Starostin also reconstructs long vowels for Proto-Altaic.

The Proto-Altaic phonological system proposed by Starostin (and, earlier, by Illič-Svityč) is an improvement over the traditional reconstruction. Starostin's reconstruction is not, however, the final word on the subject — the vowels, in particular, need considerably more work. This shortcoming has been partially addressed by Starostin, Dybo, and Mudrak in their *An Etymological Dictionary of the Altaic Languages*.

Griffen (1994:42—43) reconstructs a Proto-Altaic obstruent system close to that of the Russians. He posits three degrees along the fortis-lenis scale: aspirata, tenuis, and media:

Aspirata:	pʰ	tʰ	čʰ	kʰ
Tenuis:	p	t	č	k
Media:	b	d	ǯ	g

10.3. NEW THOUGHTS ON THE RECONSTRUCTION OF THE PROTO-ALTAIC PHONOLOGICAL SYSTEM

An important milestone in Altaic studies was reached in 2003 with the publication by Sergej A. Starostin, Anna Dybo, and Oleg A. Mudrak of *An Etymological Dictionary of Altaic Languages*. Though this dictionary must be used with caution (note the critical reviews by Georg 2004, Vovin 2005, and Norman 2009 [Starostin wrote a rebuttal to Georg's review in 2005 in *Diachronica*]), it contains much that is of value and is, in many respects, an improvement over previous efforts.

Starostin—Dybo—Mudrak (2003:24) reconstruct the Proto-Altaic phonological system as follows (where their transcriptions differ from those used in this book, their transcriptions are shown in parentheses immediately after those used here) (see also Dybo 1996:44 and 2007:13; Tenishev—Dybo 2001—2006.III:9):

Stops and affricates:	pʰ- (= pʿ-)	tʰ (= tʿ)	čʰ (= čʿ)	kʰ (= kʿ)
	p	t	č	k
	b	d	ǯ	g
Sibilants:		s	š	
		z-		
Nasals and liquids:	m	n	nʸ (= ń)	ŋ
		-l-	lʸ (= Ĺ)	
		-r-	-rʸ- (= -ŕ-)	
Glides:			-y- (= -j-)	

Vowels:	i	e	u	o	a
	ī	ē	ū	ō	ā
Diphthongs:	i̯a	i̯o	i̯u		

Starostin—Dybo—Mudrak note that **z* and **y* are in complementary distribution: **z* occurs only in initial position, while **y* is never found at the beginning of a word. Note: The reconstruction of **l^{y}* and **r^{y}* is highly controversial (cf. Poppe 1960:74—92; Robbeets 2005:78—79; Róna-Tas 1998:71—72; Stachowski 2012: 244—247).

According to Starostin—Dybo—Mudrak (2003:90), the traditional system of vowel correspondences proposed by Ramstedt and Poppe is outdated and in need of revision. Interestingly, they assume that the Proto-Altaic vowel system was completely devoid of vowel harmony, which they further assume evolved in all the subgroups at a later date as the result of complex interactions between the vowels of the first and the second syllables in polysyllabic roots and derivatives.

Starostin—Dybo—Mudrak (2003:90) assume that Proto-Altaic had five vowels (**i*, **e*, **u*, **o*, **a*) and three diphthongs (**i̯u*, **i̯o*, **i̯a*) — the diphthongs were restricted to the first syllable of the word. The interaction of eight vocalic units (**i*, **e*, **u*, **o*, **a*, **i̯u*, **i̯o*, **i̯a*) of the first syllable and five vocalic phonemes (**i*, **e*, **u*, **o*, **a*) of the second syllable led to an extremely diverse system of correspondences, of which the traditional correspondences proposed by Ramstedt and Poppe are only a small subset.

The diphthongs with **-i̯-* are basically reconstructed by Starostin—Dybo—Mudrak where Turkic and (Manchu-)Tungus have specific reflexes (**-ia-* in Turkic, **-ia-* and **-ü-* [*-iu-*] in (Manchu-)Tungus); in several cases, however, diphthongs have been lost in those subgroups as well and can be reconstructed only through circumstantial evidence.

The phonetic nature of the Proto-Altaic diphthongs is still not completely certain. Starostin—Dybo—Mudrak prefer to treat them as diphthongs because they are preserved as such in a number of cases in Proto-Turkic, Proto-(Manchu-) Tungus, and Korean, but an interpretation of the diphthongs as front vowels could also be possible. In that case, **i̯a* is to be reinterpreted as **ä*, **i̯o* as **ö*, and **i̯u* as **ü*. They note that further research is needed before a definitive solution to this problem can be reached.

The (Manchu-)Tungus system of vowels appears to be the most conservative and was used by Starostin—Dybo—Mudrak as the basis of their reconstruction. Turkic, Mongolian, and Korean usually modify the first vowel under the influence of the second one. Thus, fronted first vowels usually signal that the second vowel was a front one. However, the second vowel could also be fronted or shifted to back under the influence of the first vowel, leading to numerous variations in the reflexes. Japanese seems to have exclusively assimilated the first vowel to the second one (a process very similar to what later happened in Mongolian), so that the quality of Japanese vowels in the first syllable is normally a good indicator of

the original quality of the second vowel, which itself may have been assimilated or have disappeared altogether.

Vowels of the non-initial syllable are generally very unstable in all modern Altaic languages. They tend to become assimilated to initial vowels, are frequently contracted in various combinations with following suffixes, and are often lost completely. They are best preserved in the (Manchu-)Tungus languages and are completely lost in the majority of Turkic and Korean roots. The situation, therefore, is very close, for example, to what is found in Germanic, within Indo-European, or in the Nakh languages in the Eastern Caucasus, where the quality of non-initial vowels can only be recovered on the basis of umlaut processes in the first syllable. Thus, Starostin—Dybo—Mudrak have chosen to reconstruct non-initial vowels on indirect evidence, namely, by the way the non-initial vowels have influenced preceding vowels. They note that rules for the development of non-initial vowels in the individual Altaic subbranches have yet to be worked out and will depend substantially on the future analysis of verbal and nominal morphophonemics and accent systems.

10.4. ROOT STRUCTURE PATTERNING IN PROTO-ALTAIC

Like Uralic-Yukaghir and Elamo-Dravidian, the Altaic languages are agglutinating in structure. Pronominal stems and particles were monosyllabic (**(C)V*), while nominal and verbal stems were typically disyllabic (**(C)VCV* or **(C)VCCV*). Polysyllabic stems could be derived from the disyllabic stems by the addition of suffixes. The addition of suffixes caused no changes in the vowel of the stem, but the vowels of the suffixes were subject to vowel harmony, which means that their vowels were adjusted to the vowel of the stem. The undifferentiated stems were real forms in themselves and could be used without additional suffixes. The suffixes, both derivational and inflectional, were added mechanically to the stem.

According to Starostin—Dybo—Mudrak (2003:22—24), the most common root structure pattern in Proto-Altaic was **CVCV*, occasionally with a medial consonant cluster — **CVCCV*. The final vowel, however, was very unstable: it is best preserved in (Manchu-)Tungus languages (though it is not always easily reconstructable due to morphological processes), and it is frequently dropped in Korean, Mongolian, and Turkic (in the latter family, in fact, in the majority of cases). Japanese usually preserves the final vowel, although its quality is normally lost; however, in cases where the final (medial) root consonant is lost, Japanese reflects original disyllables as monosyllables.

Japanese also has quite a number of monosyllabic verbal roots of the type **CVC-*. These roots were originally disyllabic as well. However, reconstructing them as **CVCa-* is certainly incorrect. The Old Japanese verbal conjugation shows explicitly that the verbal stems can be subdivided into three main types: **CVCa-* (those having the gerund in *-e* < **-a-i*), **CVCə-* (those having the gerund in *-i* < **-ə-i*), and **CVC-* (those having the gerund in *-ji* < **-i*). Here, there is a possibility that the latter type reflects original verbal roots **CVCi* (occasionally perhaps also

**CVCu*, though there are reasons to suppose that some of the latter actually merged with the type **CVCə*-). The gerund form in *-*i* may actually reflect the original final root vowel that had earlier disappeared before other verbal suffixes of the type *-*V(CV)*-.

A small number of trisyllabic roots such as **alak*^{h}*u* 'to walk', **kabari* 'oar', **k*^{h}*obani* 'armpit', etc. can also be reconstructed for Proto-Altaic. It cannot be excluded that, in many or most of these cases, the final syllable was originally a suffix, but the deriving stem was not used separately, and the derivation had already become obscure in the proto-language.

The monosyllabic structure **(C)V* was typical for pronominal and auxiliary morphemes, but a small number of verbal (and, quite exceptionally, nominal) monosyllabic roots can also be reconstructed.

A special case involves a number of verbal roots that appear as monosyllables of the type **CV* in some languages but have the structure **CVl(V)* or, less frequently, **CVr(V)* in others. Starostin—Dybo—Mudrak reconstruct disyllables here, but note that the exceptional loss of **r* and **l* remains unexplained. A possible solution would be to reconstruct those roots as **CVC*, with occasional loss of the root-final resonant. However, the number of examples is not large, and the roots in question are frequently used as auxiliary verbs, which by itself could explain the exceptional phonetic development. It is also possible that *-*r*- and *-*l*- were originally suffixed and that the roots belonged instead to the rare type **CV*. Starostin—Dybo—Mudrak note that the problem requires further investigation.

There were four fundamental stem types in Proto-Altaic:

1. Verbal stems
2. Nominal and adjectival stems
3. Pronouns
4. Particles

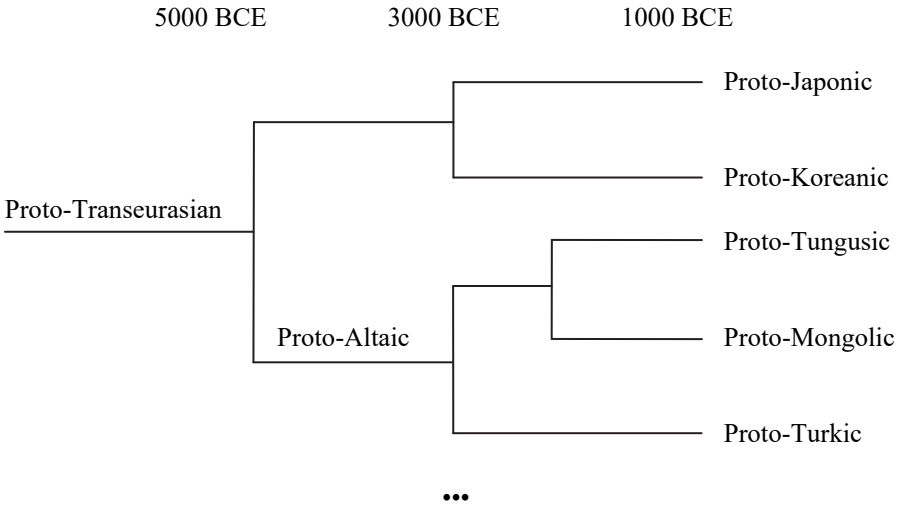
There was a strict distinction between nominal and verbal stems.

10.5. THE POSITION OF JAPANESE-RYUKYUAN (JAPONIC) AND KOREAN

Some recent work has attempted to demonstrate that Japanese-Ryukyuan (Japonic) and Korean are genetically related to each other (cf. Martin 1966, 1975, and 1991; Vovin 2001; Whitman 1985 and 2012; Francis-Ratté 2016), though Vovin has since (2010) taken a more negative view. Attempts to relate Japonic (usually Japanese alone) and Korean to other language families have generally not received wide acceptance, although the most viable comparison has been and continues to be with the Altaic languages (cf. Robbeets 2005 and subsequent work; Unger 2014). However, much work needs to be done here before this hypothesis can be accepted as proven beyond a reasonable doubt. Accordingly, Japonic and Korean data are not

included in this book except when the work of others is being referenced (as in the preceding discussion). See also Cavoto 1998:19—20.

It may be noted here that Martine Robbeets and Lars Johanson have recently coined the term "Transeurasian" to refer to a large grouping of languages that includes both the traditional Altaic languages (Chuvash-Turkic, Mongolian, and Manchu-Tungus) as well as Japonic and Korean. According to Robbeets (2015:31, 506, and 2017:214), the Transeurasian family tree may be represented as follows:



The first table of correspondences on the following pages is based upon the work of Starostin—Dybo—Mudrak (2003) (see also Griffen 1994; Dybo 2007:13—14). Older views must now be considered outdated. Only the consonants are given. The vowel correspondences are extremely complicated — for details on the vowels, cf. Starostin—Dybo—Mudrak (2003:90—134). The next set of tables is based upon the work of Robbeets (2016:206—207) — both consonants and vowels are given.

Starostin—Dybo—Mudrak consider Japanese-Ryukyuan (Japonic) and Korean to be members of the Altaic language family. Consequently, these languages are included in the table on the following page (though note the above comments on the position of these languages).

For information on the Turkic languages, cf. Tenishev—Dybo 2001—2006, Johanson—Csató (eds.) 1998, von Gabain—Pritsak—Poppe—Benzing—Menges—Temir—Togan—Taeschner—Spies—Caferoğlu—Battal-Taymas 1982, Dybo 2007; for Mongolic, cf. Janhunen (ed.) 2003, Svantesson—Tsendina—Karlsson—Franzén 2005, Poppe 1955, Poppe—Dosch—Doerfer—Aalto—Schröder—Pritsak—Heissig (eds.) 1964; and for (Manchu-)Tungus, cf. Fuchs—Lopatin—Menges—Sinor 1968, Malchukov—Whaley (eds.) 2012. See also de Rachewiltz—Rybatzki 2010. A new book on the (Manchu-)Tungus languages, under the editorship of Alexander Vovin, is currently being prepared (Vovin [ed.] to appear). For an excellent survey of the current status of Altaic studies, cf. Blažek—Schwarz—Srba 2019.

10.6. CORRESPONDENCES

Proto-Altaic	Proto-Tungus	Proto-Mongolian	Proto-Turkic	Proto-Korean	Proto-Japanese
pʰ-	p-	h-/y-	Ø-/y-	p-	p-
-pʰ-	-p-	-h-/-b-, -b	-p-	-p-	-p-
p-	p-	b-/h-	b-	p-	p-
-p-	-b-	-b-	-b-	-p-	-p-
b-	b-	b-	b-	p-	p-/b[a, ə, Vy]
-b-	-b-	-h-/-[R]b-/b[Vg], -b	-b-	-b-, -p	-p-/[iV, y]w
m	m	m	b-, -m-	m	m
tʰ-	t-	t-/č(i)-	t- [dV+lʸ rʸ r]	t-	t-
-tʰ-	-t-	-t-/-č(i)-, -d	-t-	-t-	-t-
t-	d-/ǯ(i̯)-	d-/č(i)-	d-	t-	t-/d[i ə]
-t-	-t-	-d-/-č(i)-	-t-	-t-/-r-	-t-
d-	d-	d-/ǯ(i)-	y-	t-	d-/t[V + Cʰ]
-d-	-d-	-d-/-ǯ(i)-	-d-	-t-/-r-	-t-/[iV y]y
n	n	n	y-, n	n	n
kʰ-	x-	k-	k-	k-	k-
-kʰ-	-k-/-x-	-k-/-g[Vh]-, -g	-k-	-k-/-h-	-k-
k-	k-	k-	g-	k-	k-
-k-	-k-	-g-, -g	-k-/-g[Vr]-	-Ø-/-h-, -k	-k-
g-	g-	g-	g-	k-	k-
-g-	-g-	-h-/-g[Vh]-, -g	-g-	-Ø-/-h-, -k	-k-/[iV]Ø
ŋ-	ŋ-	Ø-/y-/g[u]-/n[a o e]	Ø-/y-	n-	Ø-/n-(/m[i̯]-)
-ŋ-	-ŋ-	-ŋ-/-n-/-m-/-h-	-ŋ-	-ŋ-/-Ø-	-n-/-m-
čʰ-	č-	č-	č-	č-	t-
-čʰ-	-č-	-č-	-č-	-č-	-t-
č-	ǯ-	d-/č(i)-	d-	č-	t-
-č-	-s-	-č-	-č-	-č-	-s-
ǯ-	ǯ-	ǯ-	y-	č-	d-
-ǯ-	-ǯ-	-ǯ-	-y-	-č-	-y-
nʸ	nʸ	ǯ-, -y-/-n-	y-, -nʸ-	n-, -nʸ-	m-, -n-/-m-
-y-	-y-	-y-/-h-	-y-	-y-/-Ø-	-y-/-Ø-
-r-	-r-	-r-	-r-	-r-	-r-/-t-
-rʸ-	-r-	-r-	-rʸ-	-r-	-r-/-t[i u]-
l	l	l-/n-, -l-	y-, -l-	n-, -r-	n-, -r-
lʸ	l	d-/ǯ(i)-, -l-	y-, -lʸ-	n-, -r-	n, -s-
s	s	s	s	s-/h-, -s-	s
z-	s-	s-	y-	s-	s-
š	š	s-/č[A]-, -s-	s-/č[A]-, -s-	s	s

For comparison, Robbeets (2016:206—207) gives the following correspondences:

I. Consonants:

Proto-Transeurasian	Proto-Tungus	Proto-Mongolian	Proto-Turkic	Proto-Korean	Proto-Japanese
p-	p-	p-	b-	p-	p-
-p-	-p-	-ɣ-	-p-	-p-	-p-
b-	b-	b-	b-	p-	p-/w-
-b-	-b-	-b-/-ɣ-	-b-	-p-	-p-/-w-
-mT-	-PC-	-PC-	-P(C)-	-pC-	-np-
-Rp-	-RP-	-RP-	-RP-	-Rp-	-np-
t-	t-	t-	t-	t-	t-
-t-	-t-	-t-	-t-	-t-	-t-
d-	d- (ji-)	d- (ji-)	y-	t- (ci-)	t-/y-
-d-	-d- (-ji-)	-d- (-ji-)	-d-	-l-	-t-/-y-
-nK-	-TC-	-TC-	-TC-	-c-	-nt-
-Rt-	-RT-	-RT-	-RT-	-Rc-	-nt-
k-	k-	k-	k-	k-	k-
-k-	-k-	-k-	-k-	-k- (-h-)	-k-
g-	g-	g-	k-	k-	k-
-g-	-g-	-g-	-g-	-k- (-h-)	-k-
-ŋT-	-KC-	-KC-	-KC-	-kC-	-nk-
-Rk-	-RK-	-RK-	-RK-	-Rk-	-nk-
č-	č-	č-	č-	c-	t-
-č-	-č-	-č-	-č-	-c-	-t-
-lč	-l(č)	-l(č)	-l(č) ~ -š	-l(i)	-si
x-	x-	k-	k-	k-, h-	k-
-x-	-x-	-g- ~ -k-	-g- ~ -k-	-k-	-k-
s-	s-	s-	s-	s-	s-
-s-	-s-	-s-	-s-	-s-	-s-
m-	m-	m-	b-	m-	m-
-m-	-m-	-m-	-m-	-m-	-m-
n-	n-	n-	y-	n-	n-
-n-	-n-	-n-	-n-	-n-	-n-
-r-	-r-	-r-	-r-	-l-	-r-
-r_2-	-r-	-r-	-r_2-	-l-	-r-
-l-	-l-	-l-	-l-	-l-	-r-

Note: According to Robbeets, “Transeurasian” comprises the following branches: (Manchu-)Tungus, Mongolian, (Chuvash-)Turkic, Korean, and Japonic. She restricts “Altaic” to (Manchu-)Tungus, Mongolian, and (Chuvash-)Turkic.

II. Vowels:

Proto-Transeurasian	Proto-Tungus	Proto-Mongolian	Proto-Turkic	Middle Korean < Proto-Korean	Old Japanese < Proto-Japanese
-a-	-a-	-a-	-a-	-a- < -a-	-a- < -a-
CaCa	CaCa	CaCa	CaC	CʌCʌ	CaCa
-ə-	-e-	-e-	-e-	-e- < -e-	-a- < -a-
-ə-	-e-	-e-	-e-	-e- < -e-	-o- < -ə-
-ɔ-	-o-	-o-	-o-	-wo- < -o-	-o- < ? o-
-ɔ-	-o-	-o-	-o-	-wo- < -o-	-u- < -o-
-o-	-ö-	-ö-	-ö-	-u- < -i-	-o- < -i-
-u-	-u- (gü)	-ü-	-ü-	-wu- < -u-	-u- < -u-
-ʊ-	-u-	-u-	-u-/-ï-	-o- < -ʌ-	-u- < -u-
PʊRʊ-	PuRu-	PuRu-	PuR-	PʌRʌ- < PɨRɨ-	PaRu- < PauRu-
-i-	-i-	-i-	-i-/-ï-	-i- < -i-	-i- < -i-
a-	a-	a-	a-	a- < a-	a- < a-
ə-	e-	e-	e-	e- < e-	o- < ə-
ɔ-	o-	o-	o-	wo- < o-	o- < ? o-
o-	ö-	ö-	ö-	Ø < ? i-	o- < i-
u-	u-	ü-	ü-	wu- < u-	u- < u-
ʊ-	u-	u-	u-	Ø < ? ʌ-	u- < u-
i-	i-	i-	i-	i- < i-	i- < i-

APPENDIX: THE CONSONANT INVENTORIES OF THE ALTAIC DAUGHTER LANGUAGES

Each section will begin with the consonant inventory reconstructed for the proto-language of the branch under discussion. Then, the developments that took place in each will be sketched.

(CHUVASH-)TURKIC

The Turkic languages constitute the most geographically widespread Altaic branch. There are some thirty Turkic languages, as well as numerous dialects, some of which are quite different from the standard/national forms of the languages in question. Chuvash is the most divergent Turkic language. Indeed, it appears likely that Proto-Turkic initially split into two branches: (1) Chuvash and (2) all of the others, hence, the designation (Chuvash-)Turkic.

Starostin—Dybo—Mudrak (2003:136) reconstruct the Proto-Turkic consonant system as follows (see also Johanson 1998b:95; Robbeets 2005:75):

p	t	č	k
b	d	y (= j)	g
	s		
-m-	-n-	-n^{y}- (= -ń-)	-ŋ-
	-r-, -l-	-r^{y}-, -l^{y}- (= -ŕ-, -Ĺ-)	

Notes:

1. *p, *t, *k are assumed to have been fortes and *b, *d, *g to have been lenes (cf. Róna-Tas 1998:71; Johanson 1998b:95; Robbeets 2005:75).
2. Robbeets (2005:75) does not reconstruct *l^{y} for Proto-Turkic. She does, however, reconstruct all of the other sounds listed in the above table, including *r^{y}, which she accepts as a possible Proto-Turkic phoneme and which she writes *r$_2$ (cf. Robbeets 2005:78).
3. Tenishev-Dybo (2001—2006.III:17) reconstruct a more complicated consonant system for Proto-Turkic.
4. As noted by Robbeets (2005:76), Proto-Turkic *k and *g had front and back allophones, depending upon the quality of adjacent vowels. These allophones later became phonemic. Cf. Menges (1968b:81—107) for a discussion of the development of these (and other) sounds in the Turkic daughter languages.

First, the initial voiced labial and velar stops reconstructed by Starostin—Dybo—Mudrak for Proto-Altaic were retained in Proto-Turkic (*b-, *g- > *b-, *g-), while the voiced dental stop *d- and the voiced palato-alveolar affricate *ǯ- became *y- (*d-, *ǯ- > *y-). All of the medial voiced stops were retained (*-b-, *-d-, *-g- > *-b-, *-d-, *-g-). The medial voiced palato-alveolar affricate *-ǯ- also became *-y-

(*-ǯ- > *-y-). Robbeets assumes that initial *g- became *k- in Proto-Turkic (see also Johanson 1998b:95—96), which seems highly probable.

Next, according to Starostin—Dybo—Mudrak, the initial plain (unaspirated) voiceless stops reconstructed for Proto-Altaic became voiced stops in Proto-Turkic (*p-, *t-, *k- > *b-, *d, *g-), while the plain (unaspirated) palato-alveolar affricate *č- became *d- (*č- > *d-). Robbeets, on the other hand, assumes that the initial plain (unaspirated) stops and palato-alveolar affricate were retained, except for *p-, which was voiced (*p- > *b-). According to Starostin—Dybo—Mudrak, the medial plain (unaspirated) stops and palato-alveolar affricate were retained (*-t-, *-k-, *-č- > *-t-, *-k-, *-č-), except for *-p-, which was voiced (*-p- > *-b-), while Robbeets assumes that all of the medial plain (unaspirated) stops and palato-alveolar stops were retained as such (*-p-, *-t-, *-k-, *-č- > *-p-, *-t-, *-k-, *-č-). Starostin—Dybo—Mudrak further assume that medial *-k- became *-g- when followed by a vowel and *r (*-k[Vr]- > *-g[Vr]-).

Finally, according to Starostin—Dybo—Mudrak, initial aspirated voiceless stops reconstructed for Proto-Altaic merged with the plain (unaspirated) voiceless stops in Proto-Turkic (*t^h-, *k^h-, *$č^h$- > *t-, *k-, *č-), except for *p^h-, which was lost (*p^h- > *h- > *Ø-). Medial aspirated voiceless stops, including *-p^h-, underwent the same development (*-p^h-, *-t^h-, *-k^h-, *-$č^h$- > *-p-, *-t-, *-k-, *-č-).

Proto-Altaic *š > *$č^h$ (> *č) before back vowels but *s elsewhere, while initial *n^y- > *ǯ- (> *y-); *l^y- > *d- (> *y-); *n-, *l- > *d- (> *y-); *m- > *b-; *ŋ- > *Ø-; and *d-, *z- > *ǯ- (> *y-).

The reconstruction of Proto-Altaic *-l^y- (= *-l^2-) and *-r^y- (= *-r^2-) (cf. Poppe 1960:74—92) rests critically on the evidence from (Chuvash-)Turkic, and that evidence is open to different interpretations. Róna-Tas and Robbeets, for example, reject the reconstruction of Proto-Altaic *-l^y- and *-r^y-, while Russian scholars generally support the reconstruction of these sounds.

Starostin—Dybo—Mudrak's reconstruction is very close to the consonant system of early Old Turkic (cf. Erdal 1998:139—140 and 2004:62—85 — Erdal does not include sounds found only in loanwords) (see also Robbeets 2015:38):

	Labials	Alveolars	Palatals	Velars
Unvoiced orals	p	t	č	k
Voiced orals	v	d	y	g
Sibilants		s, z	š	
Nasals	m	n	n^y	ŋ
Liquids		r, l		

Note: According to Erdal, the voiced oral stops had fricative variants β (or v), δ, γ, but were realized as stops (b, d, g) after r, l, n, and (partially) z.

Menges (1968b:81), however, reconstructs a more complicated system for Common Turkic and Ancient Turkic (see also Tenishev—Dybo 2001—2006.III:17):

	Occlusives	Fricatives	Sibilants	Affricates	Nasals	Liquids
Deep Velar	q	(ẖ), γ				ł
Velar					ŋ	
Pre-palatal	k, g	(x)				
Palato-alveolar		š		č, ǯ	ň	
Dental	t, d	(ð)	s, z		n	l
Labial	p, b	(f), v ?				
Lingual					m	r
Semivowels: j (asyllabic i̯) w (asyllabic u̯)						

Note: The consonant inventory reconstructed by Menges represents a later stage of development. Menges (1968b:81) mentions that all of the above phonemes are found in modern Turkic and that a few more have been added.

The consonant inventory of Modern Turkish contains a series of voiceless and voiced stops and affricates (p, t, k, q; b, d, g, ğ; t͡š, d͡ž), a series of fricatives (f, s, š; v, z, ž; h), two nasals (m, n), three liquids (l, ł, r), and one glide (y). Consonant length is phonemically distinctive. Initial stops are aspirated. In the standard orthography, the following special symbols are used: ç = [t͡š]; ş = [š]; j = [ž] (this sound has a rather limited distribution); c = [d͡ž]; ğ, or "yumuşak-*g*", is used to indicate lengthening of a preceding vowel — it does not have phonemic status. For details, cf. Comrie 1997a; Csató—Johanson 1998:203—205; Kornfilt 1997:483—495 and 2009:522—527.

For the development of the consonants in the Turkic daughter languages, cf. the table of sound correspondences and accompanying notes (for consonants) in Starostin—Dybo—Mudrak 2003:137—146 (see also Dybo 2007:16—22; Johanson 1998b:95—106; Róna-Tas 1998:71—72; Tenishev—Dybo 2001—2006.III:13—16). For details on the phonological systems of the various modern Turkic languages, cf. Johanson—Csató (eds.) 1998.

MONGOLIC

Proto-Mongolic has a relatively shallow time depth. As the ancestor of all modern Mongolian languages, it represents the language that existed at the time of the geographical dispersal of the Mongols in the thirteenth century AD. Related Mongolic languages/dialects that existed alongside Proto-Mongolic as currently reconstructed were replaced around that time.

The Proto-Mongolic consonant system is nearly identical with Middle Mongolian (cf. Starostin-Dybo-Mudrak 2003:149; Janhunen 2003a:6; Robbeets 2005:72—73; Poppe 1960:9) — it may be reconstructed as follows:

	t	č	k
b	d	ǯ	g
	s		h/ɣ
m	n		ŋ
w	-r-	y (= j)	
	-l-		

Note: Poppe (1955:96—98 and 1960:10—12) reconstructs *p for Proto-Mongolic as does Robbeets (2005:72), while Janhunen (2003a:6) does not.

The Proto-Mongolic consonant inventory included labial, dental, and velar points of articulation (voiceless: *t, *k; voiced: *b, *d, *g) — the voiceless labial member was missing. There were also corresponding labial, dental, and velar nasals (*m, *n, *ŋ) as well as voiceless and voiced palato-alveolar affricates (*č, *ǯ). There was a sibilant (*s) and a glottal fricative (*h) (Janhunen 2003a reconstructs a voiceless velar fricative *x here). Starostin—Dybo—Mudrak complete the system with *w, *r, *l, and *y. However, Janhunen does not reconstruct *w for Proto-Mongolic. According to Janhunen (2003a:10), *r and *l did not occur in word-initial position.

Starostin—Dybo—Mudrak (2003:80—81) propose the following series of changes from Proto-Altaic to Proto-Mongolic:

1. Initial *š- > *$č^{h}$- before back vowels, but *š > *s in other positions.
2. Initial *p^{h}- (> *f) > *h-.
3. Initial *č- > *t-.
4. Initial *n^{y}- > *ǯ- and *l^{y}- > *d-, while initial *ŋ- > *Ø-, *n-, or *g-, depending upon the following vowel.
5. Medial *-r^{y}- > *-r-; *-l^{y}- > *-l-; and *-n^{y}- > *-n- or *-y- (distribution unclear).
6. Initial *z- > *s-.
7. Dentals are palatalized before *i: *t^{h}[i]- > *$č^{h}$[i]-; *t[i]- > *č[i]-; and *d[i]- > *ǯ[i]-. Note: This must have taken place after the merger of the vowels *ï and *ı (*ï, *ı > *i) (cf. Janhunen 2003a:7).
8. Medial *-b- > *-w- (except in clusters and before *k and *g); *-g- > *-h- (except in clusters and before *g); and *-ŋ- > *-h- (except in clusters).
9. Medial plain (unaspirated) stops are voiced: *-p- > *-b-; *-t- > *-d-; and *-k- > *-g-. Note: Medial *-č- remains unchanged: *-č- > *-č-.
10. Medial voiceless aspirated stops and palato-alveolar affricate merge with their plain (unaspirated) counterparts: *-p^{h}- > *-p-; *-t^{h}- > *-t-; *-k^{h}- > *-k-; and *-$č^{h}$- > *-č-.
11. Initial dental and velar voiceless aspirated stops and palato-alveolar affricate merge with their plain (unaspirated) counterparts: *t^{h}- > *t-; *k^{h}- > *k-; and *$č^{h}$- > *č-.

Neither Starostin-Dybo-Mudrak nor Janhunen reconstruct the postvelars *q and *ɣ (also written *γ) as separate phonemes for Proto-Mongolic — they were

exclusively nonphonemic positional variants (allophones) of the velars *k and *g, thus: *q and *ɣ could only appear before *a, *o, *u, while *k and *g appeared before *e, *ö, *ü, *i (cf. Robbeets 2005:73; see also Poppe 1960:9, 16—20, 23—25, 53—62).

Poppe (1955:95 and 1960:9) reconstructs a more complex consonant system for Common Mongolic:

		Labial	Dental & Alveolar	Palatal	Velar	
					Velar	Postvelar
Stops	Voiceless	p	t		k	q
	Voiced	b	d		g	γ (g)
Affricates	Voiceless		č			
	Voiced		ǯ			
Fricatives	Voiceless		s & š			
	Voiced	w (β)		y		
Nasals		m	n		ŋ	
Laterals			l			
Vibrants			r			

According to Poppe (1955:15), Common Mongolic still had initial *p- (or *φ-), and the sequences *-aγa-, *-aγu-, etc. were still preserved. Moreover, the vowels *ï and *i were differentiated only after *q, *γ and *k, *g. Elsewhere, *ï had already merged with *i (*ï > *i) and had palatalized immediately preceding dental stops (*ti > *či; *di > *ǯi). Poppe (1955:96) considers the ancient voiceless stops and palato-alveolar affricate to be aspirated consonants in Common Mongolic and the ancient voiced stops and palato-alveolar affricate to be unaspirated consonants — they were realized as voiceless in some positions and voiced in other positions.

Modern Mongolic languages have reintroduced /š/ through loanwords. Several languages have also added /p/, /f/, and /w/, though their status tends to be rather marginal. New sequences of dentals before /i/ have been introduced (/ti/, /di/), which were not subject to the earlier process of palatalization (no. 7 above). Initial *h- has been mostly lost in the Modern Mongolic languages, though traces are still found in Dagur. Medial *-h- has been completely lost.

Let us now look at the consonant system of Written (Literary) Mongolian. It is important to include Written Mongolian here for comparison. The reason being that, due to the relatively shallow time-depth commonly assumed for Proto-Mongolic, the Written Mongolian consonant inventory is very close, though not quite identical, to that reconstructed for Proto-Mongolic, even allowing for idiosyncrasies of the Written Mongolian writing system. Unfortunately, relatively little is known about the linguistic situation prior to Proto-Mongolic, though it may be assumed that several (perhaps mutually intelligible) Pre-Proto-Mongolic dialects existed. If only we had in-depth knowledge about these Pre-Proto-Mongolic dialects, the reconstruction of Proto-Mongolic as a whole would undoubtedly be both different and pushed much further back in time. The Written Mongolian

consonant inventory was as follows (cf. Hambis 1945:XII; see also Grønbech-Krueger 1993:9—10; Janhunen 2003b:35; Poppe 1974:17; Robbeets 2015:38; Rybatzki 2003a:64 [Middle Mongolian]):

	Occlusives		Affricates		Fricatives		Nasals	Liquids	Vibrants
	Voiceless	Voiced	Voiceless	Voiced	Voiceless	Voiced			
Bilabial	p	b					m		
Labiodental						w			
Dental	t	d			s	(z)	n	l	r
Palatal			č	ǯ	š				
Guttural	k	g					ŋ		
	q	γ							
Semivowel:	y								

The Brāhmi Bugut and Khüis Tolgoi inscriptions discovered in 2014 are over six hundred years older than the previously earliest known inscriptions in a Mongolic language. Though somewhat similar to Middle Mongolian, the language of these inscriptions also contains several archaic features. For details, cf. Vovin 2019.

For information on the phonological systems of the various modern Mongolic languages, cf. Janhunen 2012:21—55 and Janhunen (ed.) 2003; see also Nugteren 2011; Poppe 1955; Svantesson—Tsendina—Karlsson—Franzén 2005.

(MANCHU-)TUNGUS

The (Manchu-)Tungus (Tungusic) branch contains two subgroups: (1) Manchu, Sibo (also called Sibe, Xibe, Xibo), and Jurchen (extinct — formerly spoken in China) and (2) all other Tungusic languages (Evenki, Even, Solon, Negidal, Nanai [also called Gold, Goldi], Ulch, Oroch, and Udihe).

Starostin—Dybo—Mudrak (2003:156) reconstruct the Proto-(Manchu-)Tungus consonant system as follows (see also Tsintsius 1949; Robbeets 2005:68):

p	t	č	k
b	d	ǯ	g
	s	š	x
	l, -r-	-y- (= -j-)	
m	n	n^{y} (= ń)	ŋ

Notes:
1. *-r- and *-y- only occur medially.
2. The distinction between velar and uvular consonants found in modern (Manchu-)Tungus languages represents a later development. They arose as positional variants (allophones) adjacent to front or back vowels (cf. Gorelova 2002:86 [for Literary Manchu]).
3. Proto-(Manchu-)Tungus had an extensive system of medial consonant clusters (cf. Robbeets 2005:70 for details).
4. *x is lost in the majority of the (Manchu-)Tungus daughter languages.

The Proto-(Manchu-)Tungus consonant inventory included labial, dental, and velar points of articulation (voiceless: *p, *t, *k; voiced: *b, *d, *g). There were also corresponding labial, dental, and velar nasals (*m, *n, *ŋ) as well as voiceless and voiced palato-alveolar affricates (*č, *ǯ) and a palatalized nasal (*n^{y}). There were two sibilants (*s, *š) and a voiceless velar fricative (*x). Starostin—Dybo—Mudrak complete the system with *l, *-r-, and *-y-.

According to Starostin—Dybo—Mudrak (2003:78—79), the (Manchu-)Tungus consonant system is the most conservative. They note that the following changes took place and in the order listed:

1. Voicing of initial *t- and *č- (*t-, *č- > *d-, *ǯ-).
2. Spirantization of *k^{h} (*k^{h} > *x).
3. Merger of initial voiceless aspirates with their plain (unaspirated) voiceless counterparts (*p^{h}-, *t^{h}-, *č^{h}- > *p-, *t-, *č-).
4. Voicing of medial *-p- (*-p- > *-b-) and development of medial *-č- to *-s-.
5. Merger of medial voiceless aspirates with their plain (unaspirated) voiceless counterparts (*-p^{h}-, *-t^{h}-, *-č^{h}- > *-p-, *-t-, *-č-).

Finally, initial *z- became *s-, and the palatalized consonants were depalatalized (*l^{y}, *r^{y} > *l, *r), except for *n^{y}, which was retained.

Regarding the reconstruction of Proto-Tungusic intervocalic *-x-, Starostin-Dybo-Mudrak (2003: 160) note:

> Intervocalic *-x- is an innovation in PTM reconstruction, first proposed in Дыбо 1990. It is based on the distinction between -k- and -x in Ulcha, Orok and Nanai. Northern languages, as well as Oroch, Udehe and Manchu have completely merged the reflexes of *-k- and *-x-. Such a reconstruction seems probable for two reasons: 1) the languages that preserve the distinction between *-k- and *-x- are exactly the same languages that preserve initial *x-; 2) the distinction between *-k- and *-x- seems to reflect the Altaic distinction *-k- : *-k΄- (see above), thus exactly paralleling the distinction *k- : *x- in word-initial position.

This is very a very important point, inasmuch as it is, in part, the basis for the reconstruction by Starostin-Dybo-Mudrak of a three-way contrast in the series of

stops and affricates in Proto-Altaic: (1) voiceless aspirated (*p^{h}, *t^{h}, *č^{h}, *k^{h}); (2) plain (unaspirated) voiceless (*p, *t, * č, *k); and (3) voiced (*b, *d, *ǯ, *g).

Menges (1968a:36) reconstructs a slightly more complex consonant system for Proto-(Manchu-)Tungus, showing the velar ~ uvular variants mentioned above:

p	t	t^{y} (= tj)	q/k
b	d	d^{y} (= dj)	ġ/γ//g
	s		
w ?	ɬ/l	y (= j)	w ?
m	n	n^{y} (= nj)	ŋ

Gorelova (2002:85) lists the following consonants for Literary Manchu (see also Austin 1962; Maddieson 1984:283, no. 069; Ramsey 1987:219; Sinor 1968:259—260):

Place of articulation		Labial				
Mode of articulation		Bilabial	Labio-dental	Front	Dorsal	Back
Obstruents	Voiceless	p		t		k
	Voiced	b		d		g
Fricatives	Voiceless		f	s, š		h
	Voiced	v			j*	
Affricates	Voiceless				č (c)	
	Voiced				čž (cz)	
Nasals		m		n		ŋ
Laterals				l		
Flapped				r		
*[j] corresponds to [y] in other systems where [j] is used instead to indicate [ž].						

Note: Following the views of Russian scholars, Gorelova (2002:86) notes that /k/, /g/, /h/ have velar allophones [k], [g], [x] before the vowels *e*, *i*, *u* but uvular allophones [q], [ɢ], [χ] before the vowels *a*, *o*, *ū* (the symbol /ū/ is used to indicate two sounds: [ʊ] after uvulars and [o] in borrowings).

CHAPTER ELEVEN

ESKIMO-ALEUT, CHUKCHI-KAMCHATKAN, AND GILYAK

11.1. ESKIMO

While some progress has been made in reconstructing Proto-Eskimo-Aleut, the reconstruction of Proto-Eskimo is considerably more advanced at the present time, and, therefore, it is Proto-Eskimo alone that is used throughout this book, though Aleut forms are occasionally cited in the part dealing with comparative vocabulary.

According to Fortescue—Jacobson—Kaplan (1994:xi), the Proto-Eskimo phonological system is to be reconstructed as follows (note: the authors also list several non-Proto-Eskimo phonemes in their chart — these are not included below) (see also Fortescue 1998:125; Mudrak 1986):

p	t	c (= č)		k	q
v	ð		y	ɣ	ʁ
	l				
	ɬ				
m	n			ŋ	

	i	u
	ə	
	a	

11.2. CHUKCHI-KAMCHATKAN

The Chukchi phonological system is relatively simple — not only is there a very small inventory of obstruents, there is also no voicing contrast in stops. The following chart is from Maddieson 1984:416, no. 908 (see also George Campbell 1991.I:328; Comrie [ed.] 1981:243; M. Dunn 1999:43; and Ruhlen 1975:182):

Voiceless stops:	p	t		k	q	ʔ	
Voiceless affricates:			[c] č				
Voiced fricatives:			ɣ̌	ɣ			
Voiceless sibilant:			s				
Voiceless fricative lateral:		ɬ					
Nasals:		m	n		ŋ		
Glides:		w					y

Note: The voiceless dental affricate *c* (= [t͡s]) is used only by women.

Vowels:

High:	i	e	u	
				ə
Low:	e	a	o	

The Chukchi vowels form a system of vowel harmony in which the second correspondent (*e*, *a*, *o*) is labeled "dominant", and the first (*i*, *e*, *u*) "recessive". Native Chukchi words must contain either all "dominant" or all "recessive" vowels; the two correspondents cannot co-exist in the same word. The schwa (ə) is neutral in regards to the "dominant" ~ "recessive" contrast. Cf. M. Dunn 1999:48.

The system of vowel harmony found in Chukchi operates according to different principles than the system found, for example, in Altaic. In Altaic, the direction of vowel harmony is determined by the vowel of the root. In Chukchi, on the other hand, a particular morpheme is either "dominant" or "recessive"; it is the vowel of the "dominant" morpheme (this need not be the root) that influences the remaining vowels.

There are several differences between the Koryak and Chukchi phonological systems worth mentioning. In the Chavchuven dialect of Koryak, *r* and *y* have merged into *y*. In general, Koryak has a larger phonemic inventory than Chukchi, although some of the phonemes have a low frequency of occurrence. Whereas Chukchi has only *w*, Koryak distinguishes both *v* and *w* (though the opposition is neutralized to *w* in syllable-final position). Koryak also distinguishes between non-palatalized *t*, *l*, *n* and palatalized t^y, l^y, n^y, though palatalization plays primarily an affective role, being used in the formation of diminutives. There are other differences as well: for example, *l* is a voiced frictionless continuant in Koryak, while the Koryak pharyngeal *ʕ* corresponds to Chukchi *ʔ*.

The Kamchadal / Itelmen consonant system is considerably more complicated than those of Koryak and Chukchi. The Kamchadal / Itelmen consonant system contains both plain and ejective stops, voiced and voiceless fricatives, and three lateral phonemes. The following chart is based upon Ruhlen (1975:215):

Voiceless stops and affricates:	p	t	č	k	q	
Ejectives:	p’	t’	č’	k’	q’	ʔ
Voiceless fricatives:		f	s		x	χ
Voiced fricatives:	v	z		γ		
Nasals:		m	n	ɲ	ŋ	
Laterals:	l	ɬ	ʎ			
Voiced trill:		r				
Glides:		w		y		

Vowels:

i			u
e			o
	a		ɒ

Fortescue (1998:125 and 2005:6) reconstructs the phonological system of Proto-Chukchi-Kamchatkan as follows (for correspondences, cf. Mudrak 2000:11—16):

p	t	c	k	q		i		u
v	ð		ɣ	ʀ		e	ə	o
m	n		ŋ				æ	a
	l							
	r							
w		j						

Note: Even though Fortescue's reconstruction is used throughout this book, comparison with other Nostratic languages indicates that the sound reconstructed by Fortescue as [ð] was most likely a voiceless palato-alveolar affricate [č] instead.

Fortescue also mentions that there may have been a full palatal series in Proto-Chukchi-Kamchatkan as well (*/tʸ/, */nʸ/, and */lʸ/). Moreover, Fortescue claims (2005:7—8) that the ejectives found in Kamchadal / Itelmen are secondarily derived, having arisen mostly as a result of syncope.

Proto-Chukchi-Kamchatkan / Proto-Nostratic phonological correspondences (consonants only):

Chukchi-Kamchatkan	Nostratic
p	b p^h p'
t	d t^h t'
c	ʒ c^h c' s z
k	g k^h k'; g^w k^{wh} k'^w
q	q^h q' q'^w
v	x^w
ð	d^y t^{yh} t'^y s^y; ǯ č č' š
ɣ	ɢ $ɢ^w$
ʀ	r^y
m	m
n	n n^y
ŋ	ŋ
l	l
r	r
w	w
j	y l^y

The vowel harmonic relationship described above for Chukchi must also be reconstructed for Proto-Chukchi-Kamchatkan, where the "dominant" vowels **a*, **o*, **e* contrasted with the "recessive" vowels **æ*, **u*, **i* (cf. Fortescue 2005:11). Proto-Chukchi-Kamchatkan words had to contain either all "dominant" or all "recessive" vowels; the two correspondents could not co-exist in the same word (Fortescue 2005:438). The schwa (ə) was neutral in regards to the "dominant" ~ "recessive" contrast. For details, cf. Fortescue 2005:11—12.

11.3. GILYAK (NIVKH)

A notable feature of Gilyak (also called Nivkh) is that it tolerates extremely complex consonant clusters. Furthermore, initial consonants undergo various alternations, which are conditioned both by the final segment of the preceding word and by syntactical considerations. In contrast, the vowel system is fairly simple. The following chart represents the phonological system of the Amur dialect and is based primarily on Comrie (ed.) 1981:267 and Ruhlen 1975:199 (see also George Campbell 1991.II:1014; Gruzdeva 1998:10; Maddieson 1984:416, no. 909):

Voiceless stops:	p	t		k^y	k	q	
Voiceless asp. stops:	p^h	t^h			k^h	q^h	
Voiced stops:		b	d	g^y	g	ɢ	
Palato-alveolar affricate:			č				
Voiceless fricatives:	f	s			x	χ	h
Voiced fricatives:	v	z			γ	ʁ	
Nasals:		m	n		n^y	ŋ	
Voiced trill:			r				
Fricative vibrant:		ɾ					
Lateral:		l					
Glides:		w			y		
Vowels:	i	e	a	ɨ	o	u	
	[ī]		[ā]		[ō]	[ū]	

For information concerning the relationship of Gilyak / Nivkh to other Nostratic daughter languages, cf. Fortescue 1998 and 2011, Greenberg 2000, and Kortlandt 2004.

CHAPTER TWELVE

A SKETCH OF PROTO-NOSTRATIC PHONOLOGY

12.1. THE PROTO-NOSTRATIC PHONOLOGICAL SYSTEM

Proto-Nostratic had a rich system of stops and affricates. Each stop and affricate series was characterized by the three-way contrast: (1) voiceless (aspirated), (2) voiced, and (3) glottalized. The aspiration of series (1) was phonemically non-distinctive.

The Proto-Nostratic phonological system may be reconstructed as follows (cf. Bomhard—Kerns 1994:122; Illič-Svityč 1971—1984.I:147—171; Dolgopolsky 1998:101 [correspondences, pp. 102—105] and 2008, §2):

Stops and Affricates:

p^h	t^h	c^h	$č^h$	t^{yh}	$t\!\!\!\!\smile\!\!\!\!ɬ^h$	k^h	k^{wh}	q^h	q^{wh}		
b	d	ʒ	ǯ	d^y	$d\!\!\!\!\smile\!\!\!\!ɮ$ (?)	g	g^w	ɢ	$ɢ^w$		
p’	t’	c’	č’	$t’^y$	$t\!\!\!\!\smile\!\!\!\!ɬ’$	k’	$k’^w$	q’	$q’^w$	ʔ	$ʔ^w$

Fricatives:

	s	š	s^y	x	x^w		h	ħ
	z	ž (?)	z^y (?)	γ				ʕ

Glides:

w	y

Nasals and Liquids:

m	n	n^y	ŋ
	l	l^y	
	r	r^y	

(It may be noted that the above reconstruction is extremely close to what Ehret [1980:37] posits for Proto-Southern Cushitic, but without the retroflex and pre-nasalized sounds.)

Vowels: i (~ e) u (~ o)
e o
(ə ~) a

Also the sequences:	iy (~ ey)	uy (~ oy)	ey	oy	(əy ~) ay
	iw (~ ew)	uw (~ ow)	ew	ow	(əw ~) aw

As can be seen, the phonological system reconstructed above for Proto-Nostratic resembles that of Proto-Afrasian more closely than it does the phonological systems of any of the other branches. (For details about Proto-Afrasian phonology, cf. Chapter 7 of this book and Diakonoff—Militarëv—Porxomovsky—Stolbova 1987; Ehret 1995:480—482; Orël—Stolbova 1995:xvi; D. Cohen 1968:1300—1306; Diakonoff 1988:34—40; Takács 2011a.) This is as it should be, inasmuch as Afrasian was the oldest branch, the first to become separated from the rest of the Nostratic speech community. Likewise, Proto-Afrasian, together with Proto-Dravidian, are of paramount importance for the reconstruction of Proto-Nostratic morphology (see Chapters 16, 17, and 18 of this book for details).

12.2. REMARKS ON THE VOWELS

The following vowels may be reconstructed for Proto-Nostratic: **a*, **e*, **i*, **o*, and **u*. At least some of these vowels must have been subject to considerable subphonemic variation in the Nostratic parent language. The high front and back vowels **i* and **u*, in particular, may be assumed to have had lowered variants (indicated in the Proto-Nostratic reconstructions as **e* and **o* respectively), while the central low vowel **a* may be assumed to have had higher variants (indicated in the Proto-Nostratic reconstructions as **ə*). To complicate matters, **e* and **o* must also have existed as independent vocalic elements. It was the reanalysis, phonemicization, and exploitation of this subphonemic variation that gave rise, at least in part, to the ablaut and vowel harmony patterning found in the majority of the Nostratic daughter languages. It may be noted here that, according to Greenberg (1990a), traces of an earlier system of vowel harmony can be discerned in Proto-Indo-European.

It is unclear whether phonemic long vowels existed in Proto-Nostratic as well, though the evidence seems to indicate that they did not, except, probably, in nursery words.

Finally, it may be noted that, while any vowel (**a*, **e*, **i*, **o*, **u*) could appear in initial syllables, only **a*, **i*, **u* could appear in non-initial syllables. This is identical to the patterning found in Dravidian.

The Proto-Nostratic vowels were, for the most part, preserved in initial syllables in Uralic, Dravidian, and Altaic. They appear to have been originally preserved in Proto-Afrasian as well. Within Afrasian, Cushitic and Omotic are particularly conservative in their vocalism, while the vowel systems found in Semitic, Egyptian, and Berber exhibit a wholesale reduction of the inherited system (cf. Ehret 1995:55—67), similar to what is found in Sanskrit within Indo-European.

The system of vowel gradation found in Semitic, Egyptian, and Berber initially arose through morphological processes that will be discussed in the chapter on

Proto-Nostratic derivational morphology (Chapter 18, §18.2, no. 4). It appeared quite early in verbal stems and derivative nominal stems, though primary root nouns continued to maintain stable vocalism right up to the emergence of the individual daughter languages. Once established, the system of vowel gradation was greatly expanded, especially in Semitic.

The inherited vowel system underwent a thorough restructuring in both Proto-Indo-European and Proto-Kartvelian as a result of a complicated series of changes initiated by the phonemicization of a strong stress accent in the early prehistory of these branches. These developments diminish the importance of Kartvelian and Indo-European for ascertaining the Proto-Nostratic vowel system.

12.3. ROOT STRUCTURE PATTERNING IN PROTO-NOSTRATIC

Comparison of the various Nostratic daughter languages makes it possible to determine the rules governing the structural patterning of roots and stems in Proto-Nostratic. Most likely, the earliest patterning was as follows (later changes are discussed in the chapter on Proto-Nostratic morphology [Chapter 17]):

1. There were no initial vowels in Proto-Nostratic. Therefore, every root began with a consonant.
2. There were no initial consonant clusters either. Consequently, every root began with one and only one consonant. Medial clusters were permitted, however.
3. Two basic root types existed: (A) **CV* and (B) **CVC*, where *C* = any non-syllabic, and *V* = any vowel. Permissible root forms coincided exactly with these two syllable types.
4. A stem could either be identical with a root or it could consist of a root plus a single derivational morpheme added as a suffix to the root: **CVC*+*C*-. Any consonant could serve as a suffix. Note: In nominal stems, this derivational suffix was added directly to the root: **CVC*+*C*-. In verbal stems, it was added after the formative vowel: **CVC*+V_{FV}+*C*-. (FV = formative vowel.)
5. A stem could thus assume any one of the following shapes: (A) **CV*-, (B) **CVC*-, (C) **CVC*+*C*-, or (D) (reduplicated) **CVC*-*CVC*-. As in Proto-Altaic, the undifferentiated stems were real forms in themselves and could be used without additional suffixes or grammatical endings. However, when so used, a vowel had to be added to the stem: (A) **CV*- > **CV* (no change), (B) **CVC*- > **CVC*+V, (C) **CVC*+*C*- > **CVC*+*C*+V, or (D) (reduplicated) **CVC*-*CVC*- > **CVC*-*CVC*+V. Following Afrasian terminology, this vowel may be called a "terminal vowel" (TV). Not only did terminal vowels exist in Proto-Afrasian (cf. Ehret 1995:15; Bender 2000:214—215 and 2007:737—739; Hayward 1987; Mous 2012:364), they are also found in Dravidian, where they are called "enunciative vowels" (cf. Steever 1998a:15; Krishnamurti 2003:90—91; Zvelebil 1990:8—9), and in Elamite (cf. Khačikjan 1998:11; Grillot-Susini 1987:12), where they are called "thematic vowels". In Proto-Dravidian, the

enunciative vowel was only required in stems ending in obstruents, which could not occur in final position.

The derivational suffixes were derivational rather than grammatical in that they affected the meaning of a word rather than its relation to other words in a sentence.

While there were noun-deriving and verb-forming suffixes, the presence of a suffix was not necessary to the use of a noun or verb in grammatical constructions. Unextended roots could be used as either nouns or verbs.

Active verbs could be used as nouns denoting either (1) the action of the verb or (2) the agent or instrument of the action, while stative verbs could be used as nouns to indicate state. Noun stems could also be used as verbs. Thus, the distinction between nouns and verbs was not always clear. There was also a solid core of primary (underived) nouns. Reduplication was a widespread phenomenon. Undoubtedly, compounds also existed.

The original root structure patterning was maintained longer in Afrasian, Dravidian, and Altaic than in the other branches, while the patterning found in Proto-Indo-European and Proto-Kartvelian has been modified by developments specific to each of these branches. The root structure constraints found in Proto-Indo-European were an innovation. In Proto-Uralic, the rule requiring that all words end in a vowel was an innovation and arose from the incorporation of the so-called "terminal vowel" into the stem.

On the basis of the evidence of Proto-Indo-European, Proto-Kartvelian, Proto-Afrasian, Proto-Dravidian, and Proto-Altaic, it may be assumed that there were three fundamental stem types: (A) verbal stems, (B) nominal (and adjectival) stems, and (C) pronominal and indeclinable stems. Some stems were exclusively nominal. In the majority of cases, however, both verbal stems and nominal stems could be built from the same root. In Proto-Nostratic, only pronominal and indeclinable stems could end in a vowel. Verbal and nominal stems, on the other hand, had to end in a consonant, though, as noted above, when the undifferentiated stems were used as real words in themselves, a "terminal vowel" had to be added to the stem. As explained in Chapter 17, the terminal vowels were morphologically significant. Adjectives did not exist as an independent grammatical category in Proto-Nostratic.

Illič-Svityč (1971—1984) considers Proto-Nostratic to have been an agglutinating language. However, according to Dolgopolsky (1994:2838 and 2005), Proto-Nostratic probably had an analytical grammatical structure.

Those daughter languages that are highly inflected, namely, Proto-Indo-European, Proto-Kartvelian, and Proto-Afrasian, may be assumed to have gone through earlier periods of development as agglutinating languages. Such a development is suggested for Proto-Indo-European by Bomhard (1988c:475—488) and Rasmussen (1987:107—122); note also Adrados (1989b). See Chapters 19 and 20 of this book for details on Proto-Indo-European morphology.

12.4. ILLIČ-SVITYČ'S AND DOLGOPOLSKY'S RECONSTRUCTIONS

While their reconstructions are fairly close to what is proposed in this book (see above, §12.1), Illič-Svityč and Dolgopolsky arrive at their reconstructions through different sets of sound correspondences. Even though Dolgopolsky mostly adheres to the sound correspondences originally established by Illič-Svityč, he makes some modifications based upon his own research. Illič-Svityč did not prepare a table of Nostratic sound correspondences himself, but the work was done for him by his friend Vladimir Dybo and included at the beginning of volume 1 (pp. 147—171) of Illič-Svityč's posthumous Nostratic dictionary (1971—1984). The following table is taken from page 147 and includes only the stops (see also Illič-Svityč 2008):

Nostratic Init. Med.	Afras.	Kartv.	Indo-European	Uralic	Dravid.	Altaic
p‘-	p	p, ṗ	p	p-	p-	p‘-
-p‘-	p	p	p	-pp- ~ -p-	-pp- ~ -p-	-p- ~ -b-
p-	p_1	p_1 (p ~ b)	p ~ b	p-	p_1- (p- ~ v-)	p-
-p-	p_1	p_1 (p ~ b)	p ~ b	-p-	-pp- ~ -v-	-b-
b-	b	b	bh	p-	p-	b-
-b-	b	b	bh	w-	-?- ~ -v-	-b-
ṭ-	ṭ (t)	ṭ	t	t-	t-	t‘-
-ṭ-	ṭ (t)	ṭ	t	-tt- ~ -t-	-t(t)-	-t-
t-	t	t	d	t-	t-	t-
-t-	t	t	d	-t-	-t(t)-	-d-
d-	d	d	dh	t-	t-	d-
-d-	d	d	dh	-δ-	-ṭ(t)-	-d-
ḳ-	q (k)	ḳ	$\hat{k}$, k, k^{u}	k-	k-	k‘-
-ḳ-	q	ḳ	$\hat{k}$, k, k^{u}	-kk- ~ -k-	-k(k)-	-k- ~ -g-
k-	k	k	$\hat{g}$, g, g^{u}	k-	k-	k-
-k-	k	k	$\hat{g}$, g, g^{u}	-k-	-k(k)-	-g-
g-	g	g	$\hat{g}$h, gh, g^{u}h	k	k-	g-
-g-	g	g	$\hat{g}$h, gh, g^{u}h	-γ-	-:Ø-	-g-

Dolgopolsky (1998:102—105 and 2008:9—16) proposes the following Nostratic sound correspondences (as above, only the stops are given):

PN	Sem	Eg	Berb	Kart	PIE	Ural	Turk	Mong	Tung	Drav
*b-	*b	b	*b	*b	*b^{h}	*p	*b	*b	*b	*p
*-b-	*b	b	*b, *β	*b	*b^{h}	*w, ⊥_ /*p̲	*b	*b	*b	*v
*p-	*p	f	*f	*p	*p, *b	*p	*b, *p̬	*φ, ? *b	*p	*p
*-p-	*p	f	*f	*p, ? *b	*p, *b	*p, ? *w	*Ø	*φ > *ɣ	*b	
*ṗ-	*p	p	*f	*p, *ṗ	*p	*p	*h > *Ø	*φ	*p	*p
*-ṗ-	*p	p	*f	*p, *ṗ	*p	*p	*pp	*p, *b	*b	*pp
*d-	*d	d	*d	*d	*d^{h}	*t	*ȷ	*d, _i/*ʒ́	*d	*t
*-d-	*d	d	*d	*d	*d^{h}	*δ	*δ	*d	*d	ṭ/ṭṭ
*t-	*t	t	*t	*t	*d	*t	*t̬	*d, _i/*ʒ́	*d	*t
*-t-	*t	t	*t	*t	*d	*t	*t	*d	*d	*ṭ
*ṭ-	*ṭ, *t	d	*ḏ	*ṭ	*t	*t	*t‘	*t, _i/*ć	*t	*t
*-ṭ-	*ṭ, *t	d, t	*ḏ, *t	*ṭ	*t	*tt	*t‘	*t	*t	*tt/t
*g-	*g	g, ʒ	*g	*g	*g^{h}, *ĝ^{h}, *g^{wh}	*k	*k̬	*g, *ɡ	*g	*k
*-g-	*g	g, ʒ	*g	*g	*g^{h}, *ĝ^{h}, *g^{wh}	*γ	*g	*g, *ɡ, *γ, *ɣ	*g	*k
*k-	*k	k, c	*k, *g?	*k	*g, *ĝ, *g^{w}	*k	*k̬	*k, *q	*k	*k
*-k-	*k	k, c		*k	*g, *ĝ, *g^{w}	*k	*g, *k	*g, *ɡ, *γ, *ɣ	*g	*k
*ḳ-	*ḳ, *k	q	*ɣ, *k	*ḳ	*ḳ, k̂, *k^{w}	*k	*k‘, *k̬	*k, *q	*x	*k
*-ḳ-	*ḳ	ʿ ?		*ɣ	*x, *x^{w}, [*x̂?]	*Ø	*Ø	*Ø	*Ø, ? *g	*Ø

It should be noted that Semitic, Egyptian, and Berber are given separate treatment in the above table of sound correspondences, while the other branches of Afrasian (Cushitic, Omotic, Chadic) are ignored. Likewise, Turkic, Mongolian, and Tungus are listed separately.

On the basis of these sound correspondences, Dolgopolsky (1998:101 and 2008:8) reconstructs the following consonant system for Proto-Nostratic:

Stops and Affricates			Fricatives		Central	Lateral		
Vd.	Vls.	Emph.	Vd.	Vls.	Approximants	Nasals	Sonants	Vibrants
b	p	ṗ			w	m		
d	t	ṭ				n	l	
ʒ	c	ç	z	s				
ǯ	č	č̣	ž	š		ṅ (= ŋ)	ḷ	r
ʑ́	ć	ḉ	ź	ś	y	ń	ĺ	ŕ
ʒ̂	ĉ	ĉ̣	ẑ	ŝ				
g	k	ḳ				ŋ		
ɡ	q	q̇	ɣ	χ				
			ʕ	ħ (= ḥ)				
	ʔ			h				

Symbols: ʒ = d͡z; c = t͡s; ǯ = d͡ž; č = t͡š; lateral obstruents ʒ̂, ĉ, ĉ̣, ẑ, ŝ = lateralized ʒ, c, ç, z, s; palatalized consonants ʑ́, ć, ḉ, ź, ś, ń, ĺ, ŕ = palatalized ʒ, c, ç, z, s, n, l, r; ḷ and ṅ (= ŋ) = cacuminal or retroflex l and n; uvular stops: ɡ (voiced), q (voiceless), q̇ ("emphatic"); uvular fricatives: χ = Spanish j, ɣ = Arabic غ /ġ/; epiglottal (pharyngeal) consonants: voiceless ħ (= ḥ = Arabic ح), voiced ʕ (= Arabic ع).

The system of vowels posited by Dolgopolsky (2008:20—24) is identical to that reconstructed for Proto-Nostratic by Illič-Svityč (1971—1984.I:152—153):

i u ü
e o
a ä

12.5. REMARKS ON THE NOSTRATIC SOUND CORRESPONDENCES

The tables on the following pages summarize the sound correspondences existing among those branches of Nostratic dealt with in this book. These correspondences are based upon the analysis of the lexical material that forms the core of this book (Part 3, Comparative Vocabulary). The Chukchi-Kamchatkan correspondences can be found in Chapter 11.

These sound correspondences are based on three fundamental assumptions:

1. The traditional reconstruction of the Proto-Indo-European consonant system is flawed and is to be reinterpreted along the lines proposed, on the one hand, by Thomas V. Gamkrelidze and Vjačeslav V. Ivanov and, on the other hand, by Paul J. Hopper, as follows (the reconstruction of the Proto-Indo-European stop system posited by Lehmann [1952:99] is given for comparison) (see Chapter 3, §3.4, for details):

Lehmann				Gamkrelidze—Ivanov		
b	b^h	p	=	p’	bh/b	ph/p
d	d^h	t	=	t’	dh/d	th/t
g	g^h	k	=	k’	gh/g	kh/k
g^w	g^{wh}	k^w	=	k’$_{\underline{u}}$	g$_{\underline{u}}$h/g$_{\underline{u}}$	k$_{\underline{u}}$h/k$_{\underline{u}}$

2. The frequency distribution of Proto-Nostratic stops (and affricates) in the reconstruction proposed by Illič-Svityč and Dolgopolsky is in contradiction to typological predictions, and is, therefore, highly suspect (see Chapter 1, §1.5, for details; a synopsis is given below).
3. Taking into consideration (1) the radical reinterpretation of the Proto-Indo-European consonant system proposed by Gamkrelidze, Ivanov, and Hopper, as well as (2) the problems in the frequency distribution of stops (and affricates) in the reconstruction of the Proto-Nostratic phonological system proposed by Illič-Svityč and Dolgopolsky, a different set of sound correspondences is warranted.

Each of these assumptions must be evaluated independently. The reasons that each of these assumptions must be evaluated independently are as follows: Even if assumption 1 proves to be untenable, it does not invalidate assumption 2. Likewise, even if assumption 2 proves to be untenable, it does not invalidate assumption 1. Assumption 3, on the other hand, is dependent upon assumption 2 but not assumption 1. That is to say, assumption 3 is not dependent upon any particular reconstruction of the Proto-Indo-European consonant system, though, it goes without saying, if assumption 1 is valid, it reinforces the likelihood that the revised set of Nostratic sound correspondences proposed in this book is correct. Inasmuch as assumption 3 is dependent on assumption 2, however, if assumption 2 is invalid, then assumption 3 is unnecessary. Moreover, even if assumption 2 is valid and a different set of Nostratic sound correspondences is warranted, it does not necessarily follow that the alternative correspondences proposed in this book are the only possible scenario, though other scenarios are considerably less likely.

Let us now review the basis for assumption 2: The mistake that Illič-Svityč and Dolgopolsky made was in trying to equate the glottalized stops of Proto-Kartvelian and Proto-Afrasian with the traditional plain voiceless stops of Proto-Indo-European. Their reconstruction would make the glottalized stops the least marked members in the Proto-Nostratic labial series and the most marked in the velar series.

Such a reconstruction is thus in contradiction to typological evidence, according to which glottalized stops uniformly have the opposite frequency distribution (most marked in the labial series and least marked in the velar series). This means that the Proto-Nostratic glottalics have the same frequency distribution as the Proto-Indo-European plain voiceless stops. Clearly, this cannot be correct (Alexis Manaster Ramer [1997] makes the same observation). The main consequence of the mistaken comparison of the glottalized stops of Proto-Kartvelian and Proto-Afrasian with the traditional plain voiceless stops of Proto-Indo-European is that Illič-Svityč and Dolgopolsky are led to posit forms for Proto-Nostratic on the basis of theoretical considerations but for which there is absolutely no evidence in any of the Nostratic daughter languages.

The question then arises: Do these criticisms completely invalidate the cognate sets involving glottalized stops (and affricates) proposed by Illič-Svityč and Dolgopolsky? Well, no, not exactly — it is not quite that simple. In many cases, the etymologies are correct, but the Proto-Nostratic reconstructions are wrong — here, a simple rewriting of the reconstructions is all that is required. Other examples adduced by Illič-Svityč and Dolgopolsky admit alternative explanations, while still others are questionable from a semantic point of view and should be abandoned. Once the questionable examples are removed, there is an extremely small number left over (no more than a handful) that appear to support their position. However, compared to the massive counter-evidence supplied in this book (Part 3, Comparative Vocabulary), even these remaining examples become suspect (they may be borrowings or simply false etymologies). Finally, there are even some examples where the comparison of glottalized stops in Proto-Kartvelian and Proto-Afrasian with plain voiceless stops in Proto-Indo-European is correct. This occurs in the cases where two glottalics originally appeared in a Proto-Nostratic root: **C'VC'*-. Such roots are preserved without change in Proto-Kartvelian and Proto-Afrasian, while in Proto-Indo-European, they have been subject to a rule of regressive deglottalization: **C'VC'*- > **CVC'*-.

We may close this section by noting that Campbell—Poser (2008:243—264) have recently prepared a highly critical and devastating assessment of the work on Nostratic by the Moscow School in general and by Illič-Svityč in particular. They conclude:

> To summarize the results of our investigation of IS's Uralic and Indo-European data and his methods, we see serious problems with the methods utilized and with the data in a large number of the sets presented (see Campbell 1998, 1999 for details). With Uralic supposedly being the strong suit of Nostratic, we can only assume that the forms presented from the other putative Nostratic language families, where we have less expertise, probably exhibit a similar range of problems. Therefore, we do not accept the Nostratic hypothesis.

Similar views are expressed by Ringe (1995a) and Ringe—Eska (2013:265—279) regarding the work of Illič-Svityč (and Dolgopolsky).

12.6. CORRESPONDENCES

Proto-Nostratic	Proto-IE	Proto-Kartvelian	Proto-Afrasian	Proto-Uralic	Proto-Dravidian	Proto-Altaic	Proto-Eskimo
b-	b^h-	b-	b-	p-	p-	b-	p-
-b-	-b^h-	-b-	-b-	-w-	-pp-/-v-	-b-	-v-
p^h-	p^h-	p-	p-, f-	p-	p-	p^h-	p-
-p^h-	-p^h-	-p-	-p-, -f-	-p-	-pp-/-v-	-p^h-	-p(p)-
p’-	(p’-)	p’-	p’-			p-	
-p’-	(-p’-)	-p’-	-p’-			-p-	

d-	d^h-	d-	d-	t-	t-	d-	t-
-d-	-d^h-	-d-	-d-	-t-	-t(t)-	-d-	-ð-
t^h-	t^h-	t-	t-	t-	t-	t^h-	t-
-t^h-	-t^h-	-t-	-t-	-t(t)-	-tt-	-t^h-	-t(t)-
t’-	t’-	t’-	t’-	t-	t-	t-	t-
-t’-	-t’-	-t’-	-t’-	-t-	-t(t)-	-t-	-t-

d^y-	d^h-	ǯg-	d^y-	t^y-	c-	ǯ-	c-
-d^y-	-d^h-	-ǯg-	-d^y-	-t^y-	-c(c)-/-y-	-ǯ-/-d-	-c-
t^{yh}-	t^h-	čk-	t^y-	t^y-	c-	$č^h$-	c-
-t^{yh}-	-t^h-	-čk-	-t^y-	-t^y-	-c(c)-/-y-	-$č^h$-	-c(c)-
t’^{y}-	t’-	č’k’-	t’^{y}-	t^y-	c-	č-	c-
-t’^{y}-	-t’-	-č’k’-	-t’^{y}-	-t^yt^y-	-c(c)-/-y-	-č-	-c-
s^y-	s-	šk-	s^y-	s^y-	c-	s-	
-s^y-	-s-	-šk-	-s^y-	-s^y-	-c(c)-/-y-	-s-	

ʒ-	d^h-	ʒ-	ʒ-	č-	c-	ǯ-	c-
-ʒ-	-d^h-	-ʒ-	-ʒ-	-č-	-c(c)-	-ǯ-/-d-	-c-
c^h-	t^h-	c-	c-	č-	c-	$č^h$-	c-
-c^h-	-t^h-	-c-	-c-	-č-	-c(c)-	-$č^h$-	-c(c)-
c’-	t’-	c’-	c’-	č-	c-	č-	c-
-c’-	-t’-	-c’-	-c’-	-č-	-c(c)-	-č-	-c-
s-	s-	s-	s-	s-	c-	s-	
-s-	-s-	-s-	-s-	-s-	-c(c)-	-s-	
z-	s-	z-	z-	s-		z-	
-z-	-s-	-z-	-z-	-s-			

Proto-Nostratic	Proto-IE	Proto-Kartvelian	Proto-Afrasian	Proto-Uralic	Proto-Dravidian	Proto-Altaic	Proto-Eskimo
ǯ-	d^h-	ǯ-	ʒ-	č-	c-	ǯ-	c-
-ǯ-	-d^h-	-ǯ-	-ʒ-	-č-	-c(c)-	-ǯ-/-d-	-c-
$č^h$-	t^h-	č-	c-	č-	c-	$č^h$-	c-
-$č^h$-	-t^h-	-č-	-c-	-č-	-c(c)-	-$č^h$-	-c(c)-
č’-	t’-	č’-	c’-	č-	c-	č-	c-
-č’-	-t’-	-č’-	-c’-	-č-	-c(c)-	-č-	-c-
š-	s-	š-	s-	s-	c-	s-	
-š-	-s-	-š-	-s-	-s-	-c(c)-	-s-	

g-	g^h-	g-	g-	k-	k-	g-	k- q-
-g-	-g^h-	-g-	-g-	-x-	-k-	-g-	-ɣ-
k^h-	k^h-	k-	k-	k-	k-	k^h-	k- q-
-k^h-	-k^h-	-k-	-k-	-k(k)-	-k(k)-	-k^h-	-k(k)- -q(q)-
k’-	k’-	k’-	k’-	k-	k-	k-	k- q-
-k’-	-k’-	-k’-	-k’-	-k-	-k(k)-	-k-	-k- -q-

g^w-	g^{wh}-	gw/u-	g^w-	k-	k-	g-	k- q-
-g^w-	-g^{wh}-	-gw/u-	-g^w-	-x-	-k-	-g-	-ɣ-
k^{wh}-	k^{wh}-	kw/u-	k^w-	k-	k-	k^h-	k- q-
-k^{wh}-	-k^{wh}-	-kw/u-	-k^w-	-k(k)-	-k(k)-	-k^h-	-k(k)- -q(q)-
k’^{w}-	k’^{w}-	k’w/u-	k’^{w}-	k-	k-	k-	k- q-
-k’^{w}-	-k’^{w}-	-k’w/u-	-k’^{w}-	-k-	-k(k)-	-k-	-k- -q-

ɢ-	g^h-	ɢ-	ɢ- (?)	k-	k-	g-	k- q-
-ɢ-	-g^h-	-ɢ-	-ɢ- (?)	-x-	-k-	-g-	-ɣ-
q^h-	k^h-	q-	q- (?)	k-	k-	k^h-	k- q-
-q^h-	-k^h-	-q-	-q- (?)	-k(k)-	-k(k)-	-k^h-	-k(k)- -q(q)-
q’-	k’-	q’-	q’- (?)	k-	k-	k-	k- q-
-q’-	-k’-	-q’-	-q’- (?)	-k	-k(k)-	-k-	-k- -q-
ɢ^w-	g^{wh}-	ɢw/u-	g^w-	k-	k-	g-	k- q-
-ɢ^w-	-g^{wh}-	-ɢw/u-	-g^w-	-x-	-k-	-g-	-ɣ-
q’^{w}-	k’^{w}-	q’w/u-	q’^{w}- (?)	k-	k-	k-	k- q-
-q’^{w}-	-k’^{w}-	-q’w/u-	-q’^{w}-	-k-	-k(k)-	-k-	-k- -q-

Proto-Nostratic	Proto-IE	Proto-Kartvelian	Proto-Afrasian	Proto-Uralic	Proto-Dravidian	Proto-Altaic	Proto-Eskimo
t͡ɬʰ-	kʰ-	x-	t͡ɬ-	sʸ-	c-	š-	ɬ-
-t͡ɬʰ-	-kʰ-	-x-	-t͡ɬ-	-δ- (?)	-k-		-ɬ-
t͡ɬ’-	k’-	k’-	t͡ɬ’-	δʸ-	t-		
-t͡ɬ’-	-k’-	-k’-	-t͡ɬ’-	-δʸ-	-ṯ(ṭ)-		

ʕ-	ʕ͡ɦ-	Ø-	ʕ-	Ø-	Ø-	Ø-	Ø-
-ʕ-	-ʕ͡ɦ-	-Ø-	-ʕ-	-Ø-	-Ø-	-Ø-	-Ø-
ħ-	ħ͡h-	x-	ħ-	Ø-	Ø-	Ø-	Ø-
-ħ-	-ħ͡h-	-x-	-ħ-	-Ø-	-Ø-	-Ø-	-Ø-
ʔ-	ʔ-	Ø-	ʔ-	Ø-	Ø-	Ø-	Ø-
-ʔ-	-ʔ-	-Ø-	-ʔ-	-Ø-	-Ø-	-Ø-	-Ø-
ʔʷ-	ʔʷ-	w-	ʔʷ-	w-	v-/Ø-		v-
-ʔʷ-	-ʔʷ-	-w-	-ʔʷ-	-w-	-v-		-v-
h-	h-	Ø-	h-	Ø-	Ø-	Ø-	Ø-
-h-	-h-	-Ø-	-h-	-Ø-	-Ø-	-Ø-	-Ø-
x-	ħ͡h-	x-	x-	Ø-	Ø-	Ø-	Ø-
-x-	-ħ͡h-	-x-	-x-	-x-	-Ø-	-Ø-	-Ø-
xʷ-	ħ͡hʷ-	xw/u-	xʷ-	w-	v-/Ø-		v-
-xʷ-	-ħ͡hʷ-	-xw/u-	-xʷ	-x-	-v-		-v-
ɣ-	ʕ͡ɦ-	ɣ-	ɣ-	Ø-	Ø-	Ø-	Ø-
-ɣ-	-ʕ͡ɦ-	-ɣ-	-ɣ-	-Ø-	-Ø-	-Ø-	-Ø-

y-	y-	y-/Ø-	y-	y-	y-/Ø-		y-
-y-	-y-		-y-	-y-	-y-	-y-	-y-
w-	w-	w-	w-	w-	v-/Ø-		v-
-w-	-w-	-w-	-w-	-w-	-v-		-v-

m-	m-	m-	m-	m-	m-	m-	m-
-m-	-m-	-m-	-m-	-m-	-m-	-m-	-m-
n-	n-	n-	n-	n-	n-	n-	n-
-n-	-n-	-n-	-n-	-n-	-n-/-n̲-	-n-	-n-
nʸ-	n-	n-	n-	nʸ-	ñ-	nʸ-	
-nʸ-	-n-	-n-	-n-	-nʸ-	-ṉ-	-nʸ-	
-ŋ-	-n-	-n-	-ŋ-	-ŋ-	-ṉ-	-ŋ-	-ŋ-

Proto-Nostratic	Proto-IE	Proto-Kartvelian	Proto-Afrasian	Proto-Uralic	Proto-Dravidian	Proto-Altaic	Proto-Eskimo
l-	l-	l-	l-	l-	l-	l-	
-l-	-l-	-l-	-l-	-l-	-l-	-l-	-l-
-lʸ-	-l-	-l-	-l-	-lʸ-	l̤-	-lʸ-	-l- -y-
r-	-r-	-r-	-r-	r-			
-r-	-r-	-r-	-r-	-r-	-r-/-r̲-	-r-	-ʀ-
-rʸ-	-r-	-r-	-r-	-rʸ-	-r̤-	-rʸ-	

Note: In Eskimo, **-lʸ-* > *-l-* after *-i-* but *-y-* after *-u-*.

i	i e	i	i	i	i	i	i
ə	e a ə	e i	i u	e	e	e	ə
u	u o	u	u	u	u	u	u
e	e	e	e	e	e	e	i
a	a o ə	a	a	a ä	a	a	a
o	o	o	o	o	o	o	u
iy	ĭy ey ī	iy i	iy	iy i	iy ī		iy
əy	ey ay	ey i	iy uy	ey	ey ē		əy
uy	ĭy ī ĭ	uy i	uy	uy	uy ū		uy
ey	ey ĭy ē	ey i	ey	ey e	ey ē		iy
ay	ay oy	ay i	ay	ay äy	ay ā		ay
oy	oy ĭy ĭ	oy i	oy	oy	oy ō		uy
iw	ū ŭw ŭ	iw u	iw	iw	iv ī		iv
əw	ew aw ŭw ŭ	ew u	iw uw	ew	ev ē		əv
uw	ū ō ŭw ow ŭ	uw u	uw	uw u	uv ū		uv
ew	ew ŭw ŭ	ew u	ew	ew	ev ē		iv
aw	ow ŭw ŭ	aw u	aw	aw äw	av ā		av
ow	ō ow ŭw ŭ	ow u	ow	ow o	ov ō		uv

Note: The Proto-Altaic vowels are in accordance with Starostin—Dybo—Mudrak's reconstruction. The developments of the sequences **iy*, **əy*, **uy*, **ey*, **ay*, **oy*, **iw*, **əw*, **uw*, **ew*, **aw*, **ow* in Proto-Altaic are unclear.

APPENDIX:
A SKETCH OF PROTO-EURASIATIC PHONOLOGY

A comparison of the Eurasiatic daughter languages shows that the Proto-Eurasiatic consonant system was close to that reconstructed by Starostin—Dybo—Mudrak (2003:24) for Proto-Altaic, but with some notable exceptions: (1) The plain (unaspirated) voiceless stops and affricates reconstructed for Proto-Altaic by Starostin—Dybo—Mudrak were glottalized stops and affricates (ejectives) in Proto-Eurasiatic. (2) A series of postvelar stops (*q^h, *ɢ, *q’) must be reconstructed to account for the reflexes found in Proto-Chukchi-Kamchatkan (but not Proto-Eskimo). (3) A series of labiovelars (*k^{wh}, *g^w, *k’^{w}) must be reconstructed to account for the reflexes found in Proto-Indo-European. (4) A series of laryngeals must be reconstructed. (5) A series of palatalized alveolars (*t^{yh}, *d^y, *t’^{y}) must be reconstructed to account for the reflexes found in Proto-Uralic (in the other Eurasiatic daughter languages, they have the same reflexes as the palato-alveolar affricates). Finally, (6) a series of lateralized affricates (*t͡ɬ^h, * t͡ɬ’) must be reconstructed to account for the reflexes found in Proto-Uralic and Proto-Eskimo. Thus, the Proto-Eurasiatic phonological system may be reconstructed as follows:

Stops and Affricates:

p^h	t^h	$č^h$	t^{yh}	t͡ɬ^h	k^h	k^{wh}	q^h		
b	d	ǯ	d^y		g	g^w	ɢ		
p’	t’	č’	t’^{y}	t͡ɬ’	k’	k’^{w}	q’	ʔ	ʔ^w

Fricatives:

	s	s^y	x	x^w		h	ħ
	z		ɣ				ʕ

Glides:

w	y

Nasals and Liquids:

m	n	n^y	ŋ
l		l^y	
r		r^y	

I would tentatively set up a vowel system for Proto-Eurasiatic identical to that reconstructed in this book for Proto-Nostratic, leaving open the possibility that front rounded and back unrounded allophones may have started to develop, at least in some branches of Eurasiatic.

Vowels:

i (~ e)		u (~ o)
e		o
(ə ~) a		

Also the sequences:

iy (~ ey)	uy (~ oy)	ey	oy	(əy ~) ay
iw (~ ew)	uw (~ ow)	ew	ow	(əw ~) aw

CHAPTER THIRTEEN

THE NOSTRATIC HOMELAND AND THE DISPERSAL OF THE NOSTRATIC LANGUAGES

13.1. OVERVIEW

Here, we run into potentially serious problems, for we must turn to other disciplines such as archeology. Archeological data provide the raw material from which archeologists construct theories about the past. The problem is that the raw material is hardly ever complete, but rather it is limited by what has happened to survive, usually products of manual skill and craftsmanship. This means that the theories derived from the controlled analysis of the raw material involve a good deal of interpretation on the part of the observer — one's view of the past will be directly conditioned to a greater or lesser degree by the theoretical framework within which one operates as well as by one's prejudices in addition to the type of evidence employed. (To complicate matters, many of these same problems occur in the field of Linguistics [cf. Labov 1994:10—11].) Moreover, when dealing with pre-literate cultures, there is seldom a clear-cut correlation between linguistic groups and culture, and cultural spread does not always mean language spread, even when migration of people takes place — individuals or small groups of individuals moving peacefully to a new territory may simply be assimilated into the dominant population group. One could cite the example of the many ancient Greek trading colonies established on the shores of the Mediterranean and Black Seas, most of which were eventually absorbed into the surrounding communities. On the other hand, language spread can occur with a relatively small migration of people when the language belongs to conquerors or to those bearing a more technologically advanced culture — both these factors were involved, for example, in the spread of Latin to the Iberian Peninsula, Gaul, and Dacia, where modern-day Romance languages are found, nearly all of the indigenous languages existing at the time of the Roman conquest having been replaced (Basque is an exception). Another example would be the spread of Turkic languages across Central Asia, mostly replacing the Iranian languages that were spoken there at the time of the appearance of the Turkic tribes (Tajik [also called Tadzhik] is an exception). Tocharian was completely replaced and is now extinct. It goes without saying that written records, when combined with the surviving relics of material culture, give a much broader view of earlier communities and reduce the need for speculation/interpretation. Even when no written records exist, however, the analysis of the lexicon of a reconstructed proto-language can give important clues about the habitat, social organization, and material culture of the speakers of that language — this endeavor is referred to as "linguistic paleontology" or "paleolinguistics".

The question of where the probable homeland of the Nostratic proto-language is to be located is directly related to the locations of the homelands of each of the daughter languages. Since there is a fair amount of controversy surrounding this subject, it is necessary to survey current theories and to select the scenarios that seem most likely in view of linguistic, archeological, and anthropological evidence, while mindful of the problems expressed in the preceding paragraph. Let us look at each of the daughter languages in turn.

13.2. INDO-EUROPEAN

At the present time, there are two main competing theories regarding the Indo-European homeland (cf. Mallory—Adams 2006:442—463; Darden 2001): (1) according to the first theory, championed by the late Marija Gimbutas and a large number of supporters, the Indo-European homeland was located to the north of and between the Black and Caspian Seas and has been broadly identified with the "Kurgan Culture"; (2) another view, made popular by Colin Renfrew, would place the Indo-European homeland in Anatolia — similar views were put forth by Gamkrelidze—Ivanov in the second volume of their massive 1984 work (in English translation) *Indo-European and the Indo-Europeans: A Reconstruction and Historical Typological Analysis of a Protolanguage and a Proto-Culture* (an English translation of this work was published in 1995), by Krantz (1988), Dolgopolsky (1988a), and Drews (1997). Renfrew tries to link the spread of Indo-European languages in Europe with the spread of agriculture. According to Gimbutas, the period of Indo-European unity is to be placed at around 4,500 BCE, while Renfrew would place the date significantly earlier at around 7,000 BCE.

The following objections may be raised against the theory of an Anatolian homeland for Proto-Indo-European and against the view that Indo-Europeans were somehow responsible for the spread of agriculture in Europe:

1. There are no unambiguous references to Indo-Europeans in written records from the ancient Near East until just before 2,000 BCE, and the first references are to Hittites. Moreover, the Hittites were most definitely invaders (cf. Gamkrelidze 1970; Mellaart 1981; Puhvel 1994; Gerd Steiner 1990) who imposed themselves on populations speaking non-Indo-European languages — it is generally agreed that Hittite replaced Hattic, which was the indigenous language of central Anatolia (cf. Diakonoff 1990:63). Another language widely-spoken in Anatolia at the time that the Hittite texts were composed was Hurrian, which, along with the later and closely-related Urartian, may have been an early Northeast Caucasian language (cf. Diakonoff—Starostin 1986), though this is by no means proven. Thus, it is clear that there were speakers of non-Indo-European languages in Anatolia before the arrival of Indo-Europeans — Diakonoff (1990:62—63) places the Hurro-Urartian language in eastern Anatolia at least as far back as the third millennium BCE. Attempts to equate other groups (Gutians, for example) referred to in cuneiform texts with Indo-

Europeans are based upon such insufficient evidence as to be meaningless (Diakonoff [1990:63] claims that the Gutians [Qutians] were Caucasian).

2. An Anatolian homeland for Indo-European makes it difficult to account for the evidence of contact between Indo-European and Uralic (cf. Joki 1973; Anthony 2007:93—97; Häkkinen 2012b; Haarmann 1994 and 1998; Koivulehto 2002).
3. Anthony (1991:198—201, 2007, and 2013) argues that the linguistic evidence confirms the existence of four-wheeled vehicles among the Indo-Europeans. Archeological evidence indicates that four-wheeled vehicles appeared in Europe no earlier than 3,300—3,100 BCE. The correlation of the linguistic and archeological evidence brought forth by Anthony rules out a date for Indo-European unity as early as that proposed by Renfrew and suggests that "the PIE language community remained relatively intact until at least 3,300 BC" (see also Melchert 2001:233). Moreover, the association of the Indo-Europeans with the domestication of horses and with the development of four-wheeled vehicles definitely points to a North Pontic/Steppe homeland as opposed to an Anatolian homeland. I will have more to say about this below.
4. The study of Indo-European social institutions, lexicon, and mythology indicates that the Indo-Europeans were primarily mobile pastoralists and not sedentary agriculturalists, that Indo-European social structure was patriarchal, and that warriors and heroes were highly esteemed (cf. Hock—Joseph 1996:526—528; Mallory 1997:112; Sergent 1995:171—392). As early as 9,000 BCE, incipient agriculture and sedentary settlements began to appear in southeastern Anatolia. By 6,000 BCE, agriculture had spread westward to the Aegean Sea. Clearly, the Anatolian economic and cultural traditions do not match those of the Indo-Europeans. On the other hand, the economic and cultural traditions evidenced by the archeological data from the North Pontic/Steppe zone are more in line with the Indo-European situation (cf. Anthony 2007 and 2013).
5. Had the Indo-European homeland been located in Anatolia, one would expect to find abundant, clearly recognizable, and ancient Indo-European loanwords in the oldest recorded languages of the ancient Near East (Hattic, Hurrian, Sumerian, Semitic, etc.) — there are few if any such loanwords. Likewise, there are very few loanwords from any of these languages in Indo-European. Given its great antiquity and cultural influence, one would particularly expect that Sumerian loanwords would have made their way into late Proto-Indo-European and show up in the non-Anatolian Indo-European daughter languages, just as they do in Hittite. However, hardly any such loanwords can be identified. Cf. Whittle 1996.
6. While the first farmers arrived in Europe around 7,500 years ago, genetic research conducted by the Australian Centre for Ancient DNA at the University of Adelaide and reported on-line in April 2013 indicates that a new population moved into Europe around 5,000 to 4,500 years ago, causing the disappearance of the earlier populations. This research shows that the current population of Europe is not descended from the earlier Anatolian agriculturalists, providing further proof that Anatolia could not have been the Indo-European homeland.

The literature supporting a North Pontic/Steppe homeland for Indo-European is extensive and begins as far back as 1926 with the publication of V. Gordon Childe's book *The Aryans: A Study of Indo-European Origins*. Rather than presenting all of the arguments and evidence, I will summarize my own views. For detailed information on the theory of a North Pontic/Steppe homeland, cf. James P. Mallory, *In Search of the Indo-Europeans: Language, Archaeology and Myth* (1989); Thomas Markey and John A. C. Greppin (eds.), *When Worlds Collide: Indo-European and Pre-Indo-Europeans. The Bellagio Papers* (1990); the volume honoring Marija Gimbutas co-edited by Susan Skomal and Edgar C. Polomé entitled *Proto-Indo-European: The Archaeology of a Linguistic Problem. Studies in Honor of Marija Gimbutas* (1987); Benjamin W. Fortson IV, *Indo-European Language and Culture: An Introduction* (2004 [2nd edition 2010]), Chapter 2: Proto-Indo-European Culture and Archaeology; and David W. Anthony, *The Horse, The Wheel, and Language* (2007). Many important articles on the subject have appeared in issues of the *Journal of Indo-European Studies*, including numerous articles by Marija Gimbutas herself. A notable recent article in this journal is by Axel Kristinsson (2012). See also Bernard Sergent's remarkable book (in English translation) *The Indo-Europeans: History, Language, Myths* (1995) and the co-edited volume by James P. Mallory and Douglas Q. Adams entitled *Encyclopedia of Indo-European Culture* (1997) as well as their later work *The Oxford Introduction to Proto-Indo-European and the Proto-Indo-European World* (2006).

In an important paper entitled "The Epicenter of Indo-European Linguistic Spread", Johanna Nichols (1997a) has argued that the earliest Indo-European speech community ("Pre-Indo-European") was located in Central Asia. She proposes that Pre-Indo-European spread westward across the steppes, eventually arriving on the northeastern shores of the Black Sea (Nichols 1997a:135). I support this scenario. I would place the Pre-Indo-Europeans in Central Asia at about 7,000 BCE, and I would date the initial arrival of the Pre-Indo-Europeans in the vicinity of the Black Sea at about 5,000 BCE — this is somewhat earlier than the date Nichols assigns. Though it is not known what language or languages were spoken in the area before the arrival of Indo-European-speaking people, it is known that the Pre-Indo-Europeans were not the first inhabitants of the area. According to Kośko (1991:252), archeological evidence points to cultural influence spreading from the Caucasian-Pontic zone to the area of the Vistula-Oder in the earliest Neolithic (around 7,000 BCE). The direction of influence was subsequently reversed, and there appears to have been a movement of people from west to east into the Pontic area. I would equate this reversal with the arrival of the Pre-Indo-Europeans. I will venture a guess that, when the Pre-Indo-Europeans arrived on the shores of the Black Sea, they encountered and occupied territory formerly inhabited by people speaking primordial North Caucasian languages (cf. Kortlandt 1990 and 2010f). This disrupted the pre-existing cultural link between the Caucasian-Pontic zone and the Vistula-Oder area and resulted in a displacement of Caucasian languages southward toward the Caucasus Mountains. That there was contact between Indo-Europeans and Caucasians is supported by a number of shared vocabulary items between Indo-European and Northwest Caucasian. Among these are the following

(this is but a small sampling — the Northwest Caucasian examples cited below are from the Circassian branch [cf. Kuipers 1975]; a more extensive list, incorporating examples from the remaining branches of Northwest Caucasian, can be found in Chapter 21 of this book). (Note: The Proto-Indo-European reconstructions are in accordance with the Glottalic Model of Proto-Indo-European consonantism proposed by Gamkrelidze—Ivanov [1972 and 1973] and Hopper [1973] — see Chapter 3, §3.4, for details):

1. Proto-Circassian *$q'^{o}at^{h}a$ ‘to tell, to report; to announce, to make known’ ~ Proto-Indo-European *$k'^{w}et^{h}$-/*$k'^{w}ot^{h}$- ‘to say, to speak, to call’ (cf. Pokorny 1959:480—481 *$g^{u}et$- ‘to talk’: Armenian *koçem* ‘to call, to name’; Gothic *qiþan* ‘to say’; Old Icelandic *kveða* ‘to say’; Old English *cweþan* ‘to say, to speak’; Old Saxon *queđan* ‘to speak’; Old High German *quedan* ‘to speak’).
2. Proto-Circassian **wasa* ‘price’ ~ Proto-Indo-European **wes-no-m* ‘price’ (cf. Pokorny 1959:1173 *$u̯es$- ‘to buy, to sell’, *$u̯es$-*no*- ‘price’: Sanskrit *vasná-m* ‘price, value’; Latin *vēnum* ‘sale’; Greek ὦνος [< **wós-no-s*] ‘price’).
3. Proto-Circassian **warqːə* ‘nobleman’ ~ Proto-Indo-European (adj.) *$wr̥d^{h}$-*o-s* ‘grown, full-grown, tall, upright’, (adj.) *$wr̥d^{h}$-*o-s* ‘raised, upright, tall’, (stem) *$werd^{h}$-/*$word^{h}$-/*$wr̥d^{h}$- ‘to raise, to elevate; to grow, to increase’ (cf. Pokorny 1959:1167 *$u̯erdh$-, *$u̯redh$- ‘to grow’: Sanskrit *várdha-ḥ* ‘increasing, growing, thriving’, *vṛddhá-ḥ* ‘grown, become larger or longer or stronger, increased, augmented, great, large; experienced, wise, learned; eminent in, distinguished by’, *vṛddhi-ḥ* ‘growth, increase, augmentation, rise, advancement’).
4. Proto-Circassian **wala* ‘cloud’ ~ Proto-Indo-European *wel-/*wol-/*$wl̥$- ‘to moisten, to wet, to flow’: (extended forms) *wel-k^{h}-/*wol-k^{h}-/*$wl̥$-k^{h}-, *wel-g^{h}-/*wol-g^{h}-/*$wl̥$-g^{h}-, *wel-k'-/*wol-k'-/*$wl̥$-k'- ‘to wet, to moisten’ (cf. Pokorny 1959:1145—1146 *$u̯elk$-, *$u̯elg$- ‘wet, moist’: Old English *weolcen*, *wolcen* ‘cloud’; German *Wolke* ‘cloud’).
5. Proto-Circassian **nəba* ‘belly’ (note here Temirgoy *nəbəžʹə* ‘navel’; Abaza *bənʒʹa* ‘navel’; Kabardian *bənža* ‘navel’; Ubykh *nəbəžʹ* ‘navel’) ~ Proto-Indo-European (*neb^{h}-/)*nob^{h}- ‘navel’ (cf. Pokorny 1959:314—315 [**enebh*-], **embh*-, **ombh*-, **nŏbh*-, [**nēbh*- ?], *$n̥bh$- ‘navel’: Sanskrit *nā́bhi-ḥ* ‘navel’; Old High German *naba* ‘nave, hub (of a wheel)’; Old Prussian *nabis* ‘navel’).
6. Proto-Circassian **ban(a)* ‘to fight’ ~ Proto-Indo-European *$b^{h}en$- ‘to slay, to wound’ (cf. Pokorny 1959:126 **bhen*- ‘to slay, to wound’: Gothic *banja* ‘strike, blow, wound’; Old High German *bano* ‘death, destruction’).
7. Proto-Circassian **malə* ‘sheep’ ~ Proto-Indo-European **mel*- ‘wool, woolen garment’ (cf. Pokorny 1959:721 **mel*- ‘wool, woolen garment’: Greek μαλλός ‘a lock of wool, wool’).
8. Proto-Circassian **hawa* ‘but’ ~ Proto-Indo-European **hew*- [**haw*-] ‘that, other’ (cf. Pokorny 1959:73—75 **au*-, **u*- pronoun stem: ‘that, other’: Gothic *auk* ‘but, also’; Latin *au-tem* ‘but, on the other hand’).
9. Proto-Circassian **pːəyə* ‘enemy’ ~ Proto-Indo-European *$p^{h}ĕ(y/i)$- ‘to hurt, to harm, to attack’ (cf. Pokorny 1959:792—793 *$pē(i)$- ‘to hurt’: Gothic *fijands* ‘enemy’; Old Icelandic *fjándi* ‘enemy, foe’; Old English *fēonds* ‘enemy’).

10. Proto-Circassian **k'anə* 'knucklebone (used in bone game)' ~ Proto-Indo-European **k'enu-* 'knee, joint, angle' (cf. Pokorny 1959:380—381 **ĝenu-*, **ĝneu-* 'knee': Sanskrit *jā́nu* 'knee'; Latin *genū* 'knee, knot, joint'; Greek γόνυ 'knee, joint'; Gothic *kniu* 'knee'; Old English *cnēow* 'knee').
11. Proto-Circassian **k'ºasa* 'to go out (as fire, light); to escape, to run away, to desert, to elope' ~ Proto-Indo-European **k'ʷes-* 'to extinguish' (cf. Pokorny 1959:479—480 **gᵘes-*, **zgᵘes-* 'to extinguish': Lithuanian *gestù*, *gèsti* 'to go out, to die out, to become dim'; Old Church Slavic *u-gasiti* 'to put out').
12. Proto-Circassian **sama* 'heap' ~ Proto-Indo-European **sem-*/**som-* 'together, together with; one' (originally 'to gather together') (cf. Pokorny 1959:902—905 **sem-* 'one; together': Sanskrit *sa* [< **sm̥-*] 'with, together with, along with', *sám* 'with, together with, along with, together, altogether', *sa-trā́* 'together, together with', *sámana-ḥ* 'meeting, assembly, amorous union, embrace', *samūbhá-ḥ* 'heap, collection').
13. Proto-Circassian **gəya* 'smooth (of ice)' ~ Proto-Indo-European **gʰey-* 'snow, ice, winter' (cf. Pokorny 1959:425—426 **ĝhei-*, **ĝhi-* 'winter, snow': Sanskrit *himá-ḥ* 'snow, frost, hoar-frost, winter', *hemantá-ḥ* 'winter, the cold season'; Greek χιών 'snow; snow-water, ice-cold water', χεῖμα 'winter-weather, cold, frost', χειμών 'winter; wintry weather, a winter storm').

The Armenian linguist Gevork B. Djahukyan has devoted a book (1967) entitled (in English translation) *Interrelations of the Indo-European, Hurrian-Urartian, and Caucasian Languages* to exploring lexical parallels between Indo-European and Caucasian languages. Though dated, this book can still be used with profit, especially for its bibliography.

Thus, it was the area to the north of and between the Black and Caspian Seas that was most likely the final homeland of a unified Indo-European parent language (cf. Mallory 1997, especially pp. 112—113). By 3,500 BCE, Indo-European had begun to split up into different dialect groups, and Indo-European-speaking people had started to spread westward into Central Europe and southward into the Balkans (cf. Anthony 1991; Nichols 1997a:134—135). Gimbutas (1973b) suggests similar dating and identifies the spread of Bronze Age metallurgical technology with the Indo-Europeanization of Europe. For more information, cf. Anthony 2007. The Indo-European homeland is shown in Map 1, and the dispersal of the Indo-European languages is shown in Map 2 at the end of this chapter.

13.3. AFRASIAN

So much controversy surrounds the subject of the homeland of Afrasian that none of the proposals advanced to date can be considered definitive (cf. Hamed—Darlu 2003). Diakonoff (1988:23—25) presents a summary of several of the proposals — his own view is that Afrasian was located in the "South-Eastern Sahara (say, between Tibesti and Darfur)". Both Werner Vycichl (1987) and Alexander Militarëv (2000, 2002, and 2009), on the other hand, favor an Asian homeland.

According to Militarëv, the original Afrasian homeland was in the Middle East and the Arabian peninsula (cf. Diakonoff 1988:24). Diakonoff (1988:32, fn. 14) further clarifies Militarëv's views (note also the map given by Shnirelman [1997:159]):

> A more precise identification was proposed by Militarev and sustained from the archaeological and historical side by V. Shnirelman. In their opinion, the Proto-Afrasian speakers were the Natufians of the well-known early Neolithic culture of the Palestinian-Syrian area.

In my opinion, Militarëv's proposals have great merit. Henry (1992:182—184) notes that "Natufian assemblages are remarkably well-dated because of multiple lines of evidence tied to radiocarbon dates, stratigraphic successions, and artifact seriation". Henry dates the earliest Natufian finds to 10,900 BCE and the latest to 7,800 BCE (he actually says [1992:184] "as early as about 12,900 years ago to as late as about 9,800 years ago"). The earlier date agrees extremely well with the date assigned to the Afrasian parent language (approximately 10,000 BCE [that is, 12,000 years ago] according to Diakonoff [1988:33, fn. 15]). The following scenario may be proposed: Afrasian is sufficiently different from other Nostratic languages to suggest that it was the first branch to split off from the rest of the Nostratic speech community — some have even suggested that Proto-Afrasian might be a sister language to Proto-Nostratic rather than a daughter language (see below). Proto-Afrasian may be dated at roughly 10,000 BCE (cf. Militarëv 2009:95 — in a 2002 paper, Fleming places it at 11,200 BP, though he notes that earlier dates are also possible), and the Afrasian homeland may be placed in the Middle East in an area bordering the eastern shores of the Mediterranean Sea, stretching from modern-day Syria through Lebanon and south into Israel (that is, the Levant) — if Militarëv and Shnirelman are correct, the Natufian cultural complex may be identified with the Afrasian parent language. By 8,000 BCE, Afrasian had begun to split up into various dialect groups and had spread southward into the Arabian peninsula and southwestward across the Sinai peninsula into northern Africa. A northern and eastern spread followed the fertile crescent, initially as far as northern and eastern Syria — it was this dialect group that eventually developed into Proto-Semitic, which Diakonoff (1988:25) dates to the 6th—5th millennia BCE. Further spread took Afrasian languages southward down through the Arabian Peninsula, across the Bab el-Mandeb Strait, and into the Horn of Africa, westward across northern Africa, and then southward across the Sahara Desert into what is today the area bordering northern and northeastern Nigeria around Lake Chad. See also Renfrew (1992:472) and Cavalli-Sforza et al. (1994:171—174) on the spread of Afrasian languages. Map 3 shows the distribution of the Afrasian languages at about 500 BCE (this is adapted from D. Cohen [ed.] 1988:viii).

Archeological remains in the Levant (Syria-Lebanon-Israel coast and slightly inland) go back to Paleolithic times. The Levant is made up of a combination of mountains, plains, valleys, and coastal lowlands cramped into a rather small geographical area. There is plentiful evidence from Mesolithic hunter-gatherer societies. The earliest Neolithic settlements (such as Jericho, which is still

inhabited) date to at least 9,000 BCE. Several noteworthy, partially sequential, partially overlapping Neolithic cultural complexes have been identified, namely, the Mushabian, the Geometric Kebaran, and the Natufian (for details, cf. Henry 1992). The dating for these is as follows: Mushabian: between 14,170 B.P. and 11,700 B.P. (Henry 1992:125); Geometric Kebaran: between 14,330 B.P. and 12,610 B.P. (Henry 1992:155); Natufian: between 12,500 and 10,500 B.P. (Henry 1992:182 — earlier dates are given in Cavalli-Sforza et al. 1994:214). It is the Natufians who are associated with the development of agriculture. Neolithic remains from the Levant are dated well into the 5th millennium BCE. Apparently, the topography of the Levant did not favor the establishment of large, unified states, since the archeological record points to numerous, autonomous or semi-autonomous city-states instead — by the 3rd millennium BCE, there were many such city-states. The Levant stood at the cross-roads between the mighty empires in Egypt and Mesopotamia — it was an area made rich by trade, an area coveted by competing neighbors, an area with a rich and varied literature, an area that gave birth to great religions, and an area with a long and colorful history. The archeological data from the Levant are extremely rich and have been fairly intensively studied and dated, though it will still take several generations to sift through it all.

The topography of Mesopotamia is varied: the east is bounded by the Zagros mountains and the Iranian Plateau, the center is dominated by the plains surrounding the Tigris and Euphrates Rivers, the south is dominated by alluvial plains, and the west is semi-arid/desert. Several major shifts in climatic conditions have taken place over the past 15,000 years. Permanent settlements associated with agriculture and stock herding date as far back as 8,000 BCE. At this period, settlements were relatively small. By 6,000 BCE, agriculture was well-established, and larger villages appeared. Slightly later, major cultural centers (such as Eridu) emerge, trade flourishes, and wealth and population increase. Pictographic writing begins to appear at around 3,500 BCE, and this slowly develops into the cuneiform syllabary. The earliest recorded language was Sumerian — the Sumerians were located in central and southern Mesopotamia. Semitic people were located to the immediate north and west. The earliest recorded Semitic language was Akkadian. Further north, in modern-day Turkey, Caucasian languages were spoken. There were also several languages of unknown affiliation (such as Kassite). References: Balkan 1954; Diakonoff 1988; Henry 1992; Nissen 1988; Nissen—Heine 2009.

Over the past two decades or so, several scholars (such as Greenberg, Ruhlen, Militarëv, and Starostin) have suggested that Afrasian should be viewed as a sister ("coordinate") language to Nostratic rather than as a Nostratic daughter language, while others, including Illič-Svityč and Dolgopolsky, see it as a full-fledged branch of Nostratic. However, this is not necessarily an "either/or" issue. Another explanation is possible, namely, the recognition that not all branches of Nostratic are on an equal footing. Afrasian can be seen as the first branch to have become separated from the main speech community, followed soon thereafter by Elamo-Dravidian, then by Kartvelian, and, finally, by Greenberg's Eurasiatic, which was the last branch to become differentiated into separate languages and language families.

By adopting this scenario, Dolgopolsky's conclusion (2008:33) that "… the traditional Nostraticist view considering H[amito-]S[semitic] as a branch of N[ostratic] is still valid" can be maintained, while the objections raised by Ruhlen, Greenberg, Militarëv, and Starostin can also be accommodated. Thus, Afrasian is to be seen as a branch of Nostratic rather than as a sister language. It should be noted that, just before his untimely death (on 30 September 2005 at age 52), Starostin had changed his mind and had sought to reintegrate Afrasian into Nostratic.

The question of the position of Afrasian is related to the problem of the location of the Afrasian homeland in both time and space. As noted above, various possibilities have been suggested, including Africa and the Levant, while the dating has been difficult to ascertain (cf. Kitchen—Ehret—Assefa—Mulligan 2009).

Taking into account the latest research, especially in Russia, the Czech scholar Václav Blažek has recently addressed this problem (Blažek to appear). According to Blažek, the original Afrasian homeland is to be sought in the Levant. Blažek notes that the following arguments speak in favor of a location of the Afrasian parent language in the Levant:

1. Distant relationship of Afrasian with Kartvelian, Elamo-Dravidian, Indo-European, and other language families within the framework of the Nostratic Hypothesis;
2. Lexical parallels connecting Afrasian with Near Eastern languages which cannot be explained from Semitic alone;
3. Sumerian-Afrasian lexical parallels indicating an Afrasian substratum in Sumerian;
4. Elamite-Afrasian lexical and grammatical cognates explainable as a common heritage (through Nostratic or some intermediary stage);
5. North Caucasian-Afrasian parallels in cultural vocabulary explainable through contact at a very remote (pre-Semitic) period.

Blažek maintains that the most likely scenario for the disintegration of Proto-Afrasian and the migrations of speakers of the various daughter languages can be accounted for by two distinct migrations from the Levant: the first branches to become separated were Cushitic and Omotic, at around 12,000 BP. They spread southward into the Arabian Peninsula. The second series of migrations separated Egyptian, Berber, and Chadic from Semitic, which remained in the Levant, at around 11,000—10,000 BP. Egyptian, Berber, and Chadic migrated first to the Nile Delta and Valley, where Egyptian remained, while Berber and Chadic continued westward and southwestward. Blažek's views concerning the migrations of each of the individual branches of Afrasian may be summarized as follows:

1. Semitic: The Semitic ecological vocabulary indicates that the Semitic homeland is to be located in the northern Levant. The homeland of the Akkadians was in northern and central Mesopotamia. Beginning with the reign of Sargon, Akkadian began to replace Sumerian in Southern Mesopotamia. It also spread into Elam, Syria, and Anatolia. In the 2nd millennium BCE, the Babylonian

dialect was used as a diplomatic language in the Near East, including Egypt. The massive migration of the Canaanite tribes into Lower Egypt around 1700 BCE has been connected with the invasion of the Hyksos. A part of this multi-ethnic conglomeration could have been Hebrews, whose return to the Levant is described in the book of Exodus in the Bible. This narrative is supported by the linguistic analysis of the Egyptian toponyms from the Bible. The oldest Phoenician inscriptions are known from Byblos and later also from Tyre, Sidon, and other Levantine ports. During the 1st millennium BCE, Phoenicians founded numerous colonies in southern Anatolia, Cyprus, Malta, Sicily, Sardinia, the coast of Libya, Tunisia, Algeria, and on to Morocco and the Iberian Peninsula. Although the strongest of them, Carthage, was destroyed by the Romans in 146 BCE, the Phoenician/Punic language survived in North Africa until the 5th century CE. Traces of Punic influence have been identified in modern Berber languages. In the late 2nd millennium BCE, Aramaeans lived in northern Syria and northwestern Mesopotamia. During the first half of the 1st millennium BCE, their inscriptions appeared throughout the Fertile Crescent. From the end of 9th to mid-7th centuries BCE, Aramaeans were brought into North Mesopotamia as captives of the Assyrians. At the time of the fall of Assyria (612 BCE), Aramaic was already a dominant language in northern Mesopotamia, and from the time of the Babylonian captivity (586—539 BCE), Aramaic began to replace Hebrew in Palestine. Aramaic became the dominant Near Eastern language during the Achaemenid Empire (539—331 BCE), where it served as a language of administration from Egypt and northern Arabia to Central Asia and the borders of India, where the Aramaic script served as the basis for local Indian scripts. The dominant role of Aramaic in the Near East continued until the expansion of Arabic in the 7th century CE. Even though it has been mostly replaced by Arabic, small pockets of Aramaic speakers have remained in the Near East until the present day (for details, cf. Rubin 2008:72—73, §10.1; Otto Jastrow 1997). A half millennium before the rise of Islam, Arabs expanded from northern Arabia into the southern Levant and Mesopotamia. Two Arabic speaking states, Palmyra and the Nabatean kingdom, controlled the commercial routes between the Mediterranean Sea, the Red Sea, and the Persian Gulf. With the spread of Islam, the rapid expansion of Arabic began. By the 8th century CE, Arabic was used from Morocco and the Iberian Peninsula in the west to Central Asia in the east. Although Arabic has lost ground in some areas (the Iberian Peninsula, Sicily, and Iran), elsewhere, it has expanded. In Africa, it spread to the southern border of the Sahara and along the East African coast. One of the pre-Islamic languages of Yemen crossed the Red Sea into Eritrea and northern Ethiopia in the early 1st millennium BCE and became the basis of the Ethiopic branch of Semitic. Separation of the northern and southern Ethio-Semitic subbranches has been dated to 890 BCE. See also Bellwood 2004; Blench 2012; Rubin 2008.

2. Egyptian: Egyptian was spoken in the Nile Valley from Lower Nubia to the Delta, probably also in the oases of the Western Desert and, due to Egyptian expansion during the New Kingdom, also in the Sinai Peninsula and Palestine.

The unification of Upper and Lower Egypt in 3226 BCE probably stimulated a process of integration of local dialects. Only a few traces remained of the original dialectal diversity. In the course of time, new dialects developed such as the Sahidic, Akhmimic, and Bohairic dialects of Coptic.

3. Berber: Not only do the modern Berber languages spoken across North Africa from Morocco, Senegal, and Mauritania in the west to Egypt (Oasis Siwa) in the east belong to the Berber branch of Afrasian, so do the language(s) of the Libyco-Berber inscriptions attested from the Canary Islands to Libya and dated from the 7/6th century BCE to the 4th century CE, as well as fragments of languages of the original inhabitants of the Canary Islands recorded by Spanish and Italian chroniclers in the 14—16th centuries CE. No doubt, the Proto-Berbers spread westward along the Mediterranean coast from the Nile Valley. For more information, see especially Blench 2014.
4. Cushitic: A Cushitic-like substratum has been identified in Modern South Arabian, and it has been proposed that early Cushitic speakers originally occupied the entire Arabian Peninsula. Thus, they can be seen as southern neighbors of the Semites, who gradually assimilated those Cushites who did not cross the Bab el-Mandeb Strait into what is now Eritrea, Djibouti, and Ethiopia. This hypothesis is supported by the rock art of Central Arabia. The spread of Cushites in Africa is connected with the Rift Valley. In the coastal areas of Eritrea and Djibouti, where the Rift enters the African mainland, three archaic representatives of the North, Central, and Eastern branches of Cushitic are found: (1) Beja / Beḍawye, (2) Bilin, and (3) Saho-Afar, respectively. The disintegration of Cushitic probably began in this general area. Ancestors of Agaw spread throughout Eritrea and northern Ethiopia, while Beja / Beḍawye spread into the Sudan between the Nile and the Red Sea. Other East and South Cushitic languages moved further south along the Rift Valley through Ethiopia and Kenya, and even into Central Tanzania. Further migrations from the Rift Valley spread Cushites throughout the Horn of Africa and south into Kenya.
5. Omotic: Both the external and internal classifications of Omotic remain controversial; indeed, Thiel (2006) considers Omotic to be a language isolate. The separation of Omotic as a distinct branch of Afrasian from what was formerly called “West Cushitic” was originally based on a lexico-statistical analysis. But a later grammatical analysis demonstrated that most of the grammatical formants that Omotic inherited from Afrasian are shared with Cushitic. Then, it was shown that there were numerous lexical isoglosses connecting Omotic with other Afrasian branches that were not shared with Cushitic, providing further evidence that Omotic and Cushitic are sister branches, and that Omotic is not West Cushitic. That Cushitic and Omotic should be considered distinct branches of Afrasian now seems certain. The separation of Cushitic and Omotic has been dated to the early 8th millennium BCE.
6. Chadic: The disintegration of Proto-Chadic has been dated to around 5000 BCE. The easternmost Chadic language is Kajakse from the archaic Mubi group, spoken in the Waddai highlands in Southeastern Chad. This area is accessible from the Nile Valley in two ways only: along the Wadi Howar

north of Darfur and along the Bahr al-Ghazal and its north tributary Bahr al-ʿArab south of Darfur. The northern route could lead along the Batha River, which flows into Lake Fitri at the present time but which formed a part of a much larger Lake Chad in the past (around 4000 BCE). The southern route could continue along the Bahr Azoum/Salamat in the basin of the Chari River, the biggest tributary of Lake Chad. See also Dimmendaal 2016.

Another scenario, proposed by Martin Bernal, associates the final disintegration of the Afrasian parent language with the Khartoum Mesolithic and locates the latest Afrasian homeland in modern-day Sudan. Bernal (1980:4) notes that "archeological evidence from the Maghreb, the Sudan, and east Africa [makes it seem] permissible to postulate that at least three branches of Afrasian existed by the eighth millennium [BCE]". Thus, he (1980:13) dates the breakup of Proto-Afrasian to no later than about 8,000 BCE, after which there was a rapid expansion outward in all directions. Fleming has also proposed an African homeland.

Bernal (1980:17) further notes that "[t]he earliest evidence of the Khartoum Mesolithic comes from the East African Rift Valley in Kenya and Ethiopia". The precursor of the Khartoum Mesolithic seems to have been the Kenya Capsian culture, which began as far back as 20,000 years ago. This implies that the earliest homeland of Pre-Proto-Afrasian is to be sought in Ethiopia, and Bernal (1980:46—59) proposes just such a scenario.

The implications of Bernal's views are enormous. Though his views are highly speculative, they are by no means implausible. Should they turn out to be true, it would give substantial weight to the arguments that Afrasian is to be viewed as a sister language to Proto-Nostratic rather than a descendant.

13.4. KARTVELIAN

At the present time, the Kartvelian (also called "South Caucasian") languages are located in the Republic of Georgia (საქართველო), except for Laz, which is spoken in Lazistan, Turkey. Georgian has the most speakers, while Svan is the most conservative. As is to be expected by its more archaic nature, Svan was the first language to split from the rest of the Kartvelian speech community (Georgian, Mingrelian, and Laz). According to Gamkrelidze—Mačavariani (1982:23—24), Klimov, using glottochronology, has dated this split at 2,000 BCE. The next split was between Georgian and Laz-Mingrelian (together called "Zan"), which has been dated at 800 BCE. This chronology would mean positing a rather shallow time depth for Proto-Kartvelian, in the vicinity of 4,000—3,000 BCE. However, in view of the apparent contacts between Proto-Kartvelian and Proto-Indo-European (cf. Gamkrelidze 1966, 1967, and 1970:141), Proto-Kartvelian must have been roughly contemporaneous with Proto-Indo-European, which would imply a slightly earlier date. Therefore, I would cautiously suggest a date of around 5,000 BCE for Proto-Kartvelian. It is certain, at the very least, that Kartvelians were in their current location by that date.

Gamkrelidze—Ivanov (1984.II:880—881, fn. 2; 1995.I:777, fn. 19) discuss the questions of the Kartvelian homeland and the dating of the proto-language in detail:

> Proto-Kartvelian (South Caucasian) dates to the fourth to the third millennia B.C. Glottochronological evidence puts the beginning of its differentiation in the very early second millennium B.C. (and possibly much earlier), at which time Svan separated out and Proto-Kartvelian divided into two separate areas, Svan and Georgian-Zan, the latter subsequently splitting into Georgian and Zan (or Colchidian)…
>
> Proto-Kartvelian prior to its breakup must be placed, on the evidence of archaic lexical and toponymic data, in the mountainous regions of the western and central part of the Little Caucasus (the Transcaucasian foothills). The first wave of Kartvelian migrations to the west and northwest, in the direction of the Colchidian plains, must have begun with one of the western dialects in the third millennium B.C. and led to the formation of Svan, which spread to the western Transcaucasus and was superimposed on local languages, probably of the Northwest Caucasian type, which thus became substratal to Svan. Svan was gradually displaced to the north, to the Great Caucasus range, by the next wave of migrations, which occurred approximately nine centuries later (on glottochronological evidence) and removed the westernmost remaining dialect as far as the Black Sea coast. This western dialect gave rise to the later Colchidian — or Zan, or Mingrelian-Laz — language, one of the languages of ancient Colchis.
>
> The dialects which remained in the ancient Kartvelian homeland underlie Georgian. In historical times, speakers of Georgian spread to the west, to part of the Colchidian territory, splitting the Colchidian language into two dialects and setting up the development of Mingrelian and Laz (Chan) into independent languages. They also spread to the north and northeast, displacing languages of the Northeast Caucasian type.
>
> These Kartvelian migrations triggered the breakup of Proto-Kartvelian and the expansion of its dialects beyond the original territory.

Nichols (1997a:138) speculates that Pre-Kartvelian originated in Central Asia, near Pre-Indo-European, and that it spread westward along a southern route below the Caspian Sea, eventually reaching its present location, where it stayed.

13.5. URALIC-YUKAGHIR

There is general agreement about the homeland of Uralic — Décsy (1990:9), for example, places the Uralic proto-language "in the Forest-Zone-Steppe-Border (mainly north of it) between the Volga Bend in Eastern Russia and the Ob River in Western Siberia" (for more information on the Uralic homeland, cf. Collinder 1965:28—30; Fortescue 1998:180—183; Hajdú 1972:17—23 and 1975:30—40; Häkkinen 2012a; Janhunen 2009; and Napolskikh 1995).

The date at which the unified Uralic parent language is thought to have been spoken is 4,000—5,000 BCE (cf. Suihkonen 2002:165; Janhunen 2009:68), while

bringing in Yukaghir pushes that date back another millennium or so and moves the homeland slightly to the east. Nichols (1997a:140—141) also sees Pre-Uralic as having spread westward and northward from Central Asia, slightly just ahead of the westward movement of Pre-Indo-European. Pre-Uralic took a more northerly route, while Pre-Indo-European took a more southerly route directly across the steppes.

A number of scholars have claimed that Indo-European and Uralic are more closely related to each other than either of them is to any other language or language family, while others have claimed that Uralic and Altaic are particularly close, even going so far as to set up a Ural-Altaic language family. The Ural-Altaic hypothesis is generally no longer supported by specialists in the field. The Indo-Uralic hypothesis, however, may indeed have some validity. I would very, very tentatively set up an Indo-Uralic subbranch within Eurasiatic (note, in particular, Kortlandt 2010e), suggest that Indo-Uralic be located in Central Asia not far from the Aral Sea, and place the date of Indo-Uralic at around 7,000 BCE. This is definitely an area that requires additional research. We will close by citing Collinder's (1965:29—30) tantalizing remarks on the possibility of a relationship between Proto-Indo-European and Proto-Uralic and the question of homelands:

> As we shall see later, Uralic and Indo-European seem to have several words in common. If these words were borrowed from Common Indo-European, the speakers of Common Uralic must have been the neighbors of the speakers of Common Indo-European. If we account for them by assuming that Uralic and Indo-European are interrelated, we arrive at the conclusion that the Uralians and the Indo-Europeans once had a common *Urheimat*. Both alternatives imply that the Indo-Europeans lived to the north of the Black Sea, and the Uralians lived to the north of them.

There is evidence of both continuous contact after they had become independent language families — they were indeed neighbors — and earlier genetic relationship between Proto-Indo-European and Proto-Uralic. Cf. Anthony 2007:93—97.

13.6. ELAMO-DRAVIDIAN

Proto-Dravidian may be dated at approximately 5,000 BCE — Zvelebil (1970:18), for instance, notes that by 4,000 BCE, Dravidian had already started to break up into different dialect groups, Brahui being the first group to split off from the main speech community (note: the dates proposed by Pejros—Shnirelman [1988] are far too shallow [for example, they place Proto-Elamo-Dravidian at the 5th—4th millennia BCE], considering that Elamite is already attested as a separate language in written records [so-called "Proto-Elamite" — assumed to be Elamite but as yet undeciphered] as early as the Jemdet Nasr period, that is, around 3,000 BCE [cf. Reiner 1969:56], though it is not until considerably later, after the adoption of cuneiform by the Elamites, that abundant records begin to appear [the earliest document in cuneiform is the so-called "Treaty of Narām-Sin", which is dated at just before 2,200 BCE]). At the present time, the overwhelming majority of

Dravidian languages are located in the southern half of the Indian subcontinent and in the northern part of Śri Lanka, though a few outliers are found to the northwest and northeast of the main body of Dravidian languages — Brahui, for instance, is spoken in the Qalat, Hairpur, and Hyderabad districts of Pakistan (plus a smaller number of speakers in Iran and southern Afghanistan), while Kuṛux is spoken in the districts of Bihar, Orissa, and Madhya Pradesh, and Malto near the borders of Bihar and West Bengal (cf. Zvelebil 1970:15—18; Ruhlen 1987:136—137). We may note in passing that the inscriptions of the Indus Valley (Harappan) Civilization may have been written in an early Dravidian language (cf. Fairservis 1992:14—23 and Parpola 1994; but see also Zide—Zvelebil [eds.] 1976 for a critical assessment of earlier Soviet attempts to decipher the Indus Valley script).

David McAlpin (1981) has presented convincing evidence for a genetic relationship between Elamite and Dravidian, and many prominent scholars now accept this view (though there are still some notable holdouts!). I would suggest a date of 8,000 BCE for Proto-Elamo-Dravidian, though a bit later (say, 7,000 BCE) is also possible. Elamite, which is now extinct, was located primarily in south-western Iran, in the vicinity of the Zagros mountains as well as the adjacent plains of Khuzistan and to the south along the coast of the Persian Gulf. There is good reason to believe that Elamite once occupied nearly all of the Iranian plateau.

Pejros—Shnirelman (1988) accept the Elamo-Dravidian hypothesis. They argue for a "western origin" of the Dravidian languages "somewhere in the Middle East". After the disintegration of Proto-Elamo-Dravidian, "the Dravidian languages could begin to spread eastwards to South Asia". Though, as noted above, their dating is questionable, the scenario they propose for the spread of Dravidian languages into India is plausible. Thus, the Elamo-Dravidian homeland may be placed roughly in western and central modern-day Iran at about 8,000 BCE. Elamo-Dravidian gradually spread eastward covering all of the Iranian plateau and extending into modern-day Pakistan and northwestern India. There was then an east-west split, with Proto-Elamite developing in the western area and Proto-Dravidian developing in the eastern area. Thus, the Dravidian homeland may be placed in Pakistan and northwestern India and dated at about 5,000 BCE, from which Dravidian languages spread southward into India proper (note the map in Andronov 2003:23). The invasion of Indo-Aryans (occurring in several phases during the period of about 1,700—1,400 BCE [cf. Burrow 1973:30—34]) drove the Dravidians further south and severed the geographical links between Brahui, Kuṛux, and Malto and the main body of Dravidian languages. Similar views are expressed by Cavalli-Sforza et al. 1994:221—222; see also Tony Joseph 2017. But, cf. Krishnamurti (2003:2—5) for a critical assessment of these views.

Pejros—Shnirelman (1988) correlate the movement of the Dravidian languages into India with archeological evidence of the Neolithic and Chalcolithic. After surveying faunal and floral terminology in Central-Southern Dravidian languages, they discuss agricultural and stock-raising terminology. This combined evidence confirms a high level of agriculture in West-Central India by about 2,000 BCE. They associate this area and culture with the homeland of Central-Southern Dravidian. This is the region from which Central-Southern Dravidian languages

spread eastward and southward. They also note that the archeological evidence as well as linguistic reconstructions indicate that arable farming was widespread in the western South Asian regions already by the late third millennium BCE and that both the "Harappans and the Chalcolithic inhabitants of Central India and Maharashtra kept goats, sheep, humped cattle, buffaloes, pigs, and dogs".

Neolithic settlements in Iran (Tepe Ganj Dareh, for example) have been dated to before 7,000 BCE. The dwellings from this period were constructed of sun-dried mud bricks, and the inhabitants herded goats and produced lightly-fired pottery. In the 5th and 4th millennia BCE, the settlements had grown to large towns — Susa had already been established (Susa was the capital of Elam). At that time, the western part of Iran was under the influence of the Ubaid and Uruk cultures of Mesopotamia. Though it is probably safe to say that an early form of Elamite was the language of western and southern Iran (and most likely well to the east) by this time, Caucasian languages were spoken in the northwestern part of Iran on into modern-day Turkey (as evidenced by the later Hurrian and Urartian). By the 3rd millennium BCE, there were several Bronze Age cultures in Iran. In the west and south, the Elamite kingdom had been established — it lasted until it was destroyed by the Assyrians in 640 BCE. As noted above, the earliest "Proto-Elamite" inscriptions date to this period. To the north of Elam, in what is currently central and western Iran, the Giyan culture was flourishing — it lasted nearly a thousand years. Another noteworthy cultural center (at sites such as Sharh-i Sokhte and Tepe Yahya) existed in southeastern Iran, not far from the Indus Valley (Harappan) Civilization. In the middle of the 2nd millennium BCE, Persian tribes began invading from the northeast, and, by 1,200 BCE, they had conquered nearly all of Iran.

The India-Pakistan cultural area is enormous and has always been heterogeneous — even now, there is still tremendous variety. In the 3rd millennium BCE, Baluchistan and northwestern India were part of the vast Mesopotamian-Iranian-Indus Valley cultural complex. Copper-working agriculturalists were living in well-built villages. Trade routes were thriving. By 2,500 BCE, the Indus Valley (Harappan) Civilization was well-established — it extended over most of Baluchistan, north well into Punjab, and south as far as the Gulf of Cambay. Indo-Aryan tribes began invading from the northwest at about 1,700 BCE. Given the geography, claims that the Indus Valley inscriptions were written in an early form of Dravidian are not impossible, though another possibility is that the language of the Indus Valley Civilization may have constituted an independent branch of this language family, related to but distinct from both Elamite and Dravidian (cf. Southworth 2006). References: Dani—Masson (eds.) 1992. For information about the Indus Valley (Harappan) Civilization, cf. McIntosh 2002 and Possehl 2002.

13.7. ALTAIC

At the present time, Altaic languages cover an enormous territory, beginning with Turkey in the west; stretching eastward across the Russian Federation and the

republics of Central Asia in the middle and across nearly all of northern Siberia; encompassing all of Mongolia, parts of northern, northwestern (Xīnjiāng Wéiwú'ěr Zìzhìqū [新疆维吾尔自治区]) and northeastern China (Dōngběi [東北]) (the area formerly called "Manchuria" [Mǎnzhōu (滿洲)], but now mostly divided into Jílín [吉林], Hēilóngjiāng [黑龙江], and Liáoníng [辽宁] provinces along with part of the Inner Mongolia Autonomous Region [Nèi Měngǔ Zìzhìqū (内蒙古自治区)]); possibly even reaching down into the Korean peninsula; and ending far to the east in Japan. The spread of Turkic and Mongolian languages across vast stretches of Eurasia has occurred within the past two millennia — the first westward forays of Altaic tribes began with the Huns, going as far back as Roman times (Nichols [1997a] gives a good overview of the spread of Turkic and Mongolian languages; see also Menges 1968b:16—53 and Golden 1992). (Manchu-)Tungus languages were once more widely spoken but have lost considerable ground fairly recently.

In the middle of the first millennium BCE, Turkic tribes were concentrated in the vicinity of modern-day Mongolia and just to the north (cf. Golden 1998:16—17), while Mongolian tribes were direct neighbors to the east, south, and southeast. Tungus tribes were to the north and northeast. Indo-European languages covered most of Central Asia (Iranian) and parts of Xīnjiāng (新疆) (Tocharian). To the extreme northeast were Chukchi-Kamchatkan peoples. Prior to their expansion to the west, Altaic-speaking people had lived for millennia in the area delimited above in small pastoral nomadic tribes, apparently freely intermingling with one another.

Menges (1968b:56—57) specifies the original geographical distribution of the Altaic languages as follows (see also Golden 1998:16 and Vovin 2013):

> Not discussing here the position of Korean, and not including it in the Altajic group of languages proper, this group originally comprised four large families:
>
> I. Hunnic, originally in the southwest and south of the Altajic area, although we know so little about it that we include it in Altajic mainly because it apparently survives in Volga-Bulgarian and present-day Ťăvaš [Chuvash];
>
> II. Turkic, originally in the northwest and west;
>
> III. Mongolian, in the center and southeast; and
>
> IV. Tungus, in the north and northeast.
>
> Of all of these, Turkic represents the most recent evolutionary type, while Mongolian, though more archaic than Turkic, nevertheless shows a more recent type of development than does Tungus, which is the most archaic type of Altajic, and thus serves as an excellent "time-table" for relative evolutionary age in Altajic.
>
> For the times prior to the separation and differentiation from the primordial nucleus groups of Altajic, which were later to become the four Altajic divisions mentioned above, a habitat must be assumed which probably comprised all of the Central Asiatic steppes, so that the term "Altajic" languages is actually justified, since it designates that group of languages spoken around the Altaj Mountains, in a wider sense of the term, in this case on the steppes extending to the south around the Altaj…

Recently, Robbeets (2017a:212) has placed the Altaic homeland in northeastern China and linked it with the Xīnglóngwā (興隆洼文化) culture (6200—5400 BCE).

13.8. OTHERS

13.8.1. CHUKCHI-KAMCHATKAN

The Chukchi-Kamchatkan family includes the following languages: Chukchi, Koryak, Kerek, Alyutor, and Kamchadal (also called Itelmen or Itelmic). Koryak, Kerek, and Alyutor are extremely close as a group, and these, in turn, are close to Chukchi. Kamchadal, which is now on the verge of extinction, stands apart from the others. The Chukchi-Kamchatkan languages are found in the extreme northeast corner of Siberia in the Chukota and Kamchatka peninsulas. Though written languages were developed for Chukchi, Koryak, and Kamchadal in the 1930's, only Chukchi is still being used in publications and education.

13.8.2. GILYAK

Gilyak (also called Nivkh) is usually considered to be a single language, but the two main dialects, namely, the Amur dialect, on the one hand, and the Sakhalin (or Eastern) dialect, on the other, are not mutually intelligible. Of the two, the Sakhalin dialect is the more archaic. The Gilyaks are found on the lower reaches of the Amur River and on Sakhalin Island. Though a written language was developed for the Amur dialect in the 1930's, next to nothing has appeared in it.

Recently, Fortascue (2011) has presented compelling evidence for a close relationship between Gilyak / Nivkh and Chukchi-Kamchatkan.

13.8.3. ESKIMO-ALEUT

As the name implies, Eskimo-Aleut has two branches: Eskimo and Aleut. The Aleut dialects are mutually intelligible. However, this is not the case with the Eskimo dialects. Two main Eskimo dialect groups are distinguished, namely, Yupik and Inuit (also called Inupiaq). Yupik speakers are concentrated in southwestern Alaska, beginning at Norton Sound and extending southward along the western and southern coasts and inland. An extremely small enclave of Yupik speakers is found in northeastern Siberia as well — the result of a fairly recent migration. Inuit speakers are found north of Norton Sound all the way to the northern coast of Alaska and extending eastward across all of the northernmost parts of Canada and on into Greenland. Aleut is spoken on the Aleutian Islands and the Commander Islands. For more information, cf. Fortescue 1998:178—180.

13.9. NOSTRATIC

Now that we have surveyed the homelands and/or present locations of the Nostratic daughter languages, we are in a position to try to determine the probable homeland of Nostratic itself. Before beginning, however, let us quote what Aharon Dolgopolsky, John C. Kerns, and Henrik Birnbaum have to say about Nostratic in

general, about its structure, about its dating, and about its homeland — this will set the stage for what follows.

First, Dolgopolsky (1994:2838):

> The [Nostratic] parent language had, most probably, an analytical grammatical structure with a strict word order (sentence-final predicate; object preceding the verb; nonpronominal attribute preceding the head; a special position for unstressed pronouns) and with grammatical meaning expressed by word order and auxiliary words (e.g., postpositions: **nu* for genitive, **ma* for marked accusative, and others). In the descendant languages this analytic grammar evolved towards a synthetic one. The phonological system (reconstructed by V. Illič-Svityč (1971—84) and A. Dolgopolsky (1989) in the framework of a Nostratic historical phonology) included a rich consonantism (with threefold opposition of voiced/voiceless/glottalized [ejective] stops and affricates, with three series of sibilants and affricates, with lateral obstruents, laryngeal, pharyngeal, and uvular consonants), and a vowel system of 7 vowels. The ancient Nostratic parent language seems to have existed in the Pre-neolithic period (up to ca. 15,000 or 12,000 BC) somewhere in southwest Asia. But most descendant proto-languages (e.g., Proto-Indo-European) existed during the neolithic period (with agriculture and husbandry, resulting in a demographic explosion, which can explain their spread throughout Eurasia and the northern half of Africa).

In his 1998 book *The Nostratic Macrofamily and Linguistic Palaeontology*, Dolgopolsky applies the techniques of linguistic palaeontology to try to establish a possible date when Proto-Nostratic was spoken (somewhere between 15,000 to 12,000 BCE), to locate its place of origin or "homeland" (in southwest Asia, that is to say, in the Near East in the vicinity of the Fertile Crescent), and to get a rough idea about the social organization and material culture of the speakers of the parent language (late Upper Palaeolithic ~ early Mesolithic). In this book, the focus of Dolgopolsky's attention is exclusively on putative etyma pertaining to habitat, social organization, and material culture — Dolgopolsky is not concerned here with presenting all of the evidence he has gathered in support of the Nostratic macrofamily. The full evidence is presented in his massive *Nostratic Dictionary* (a draft of which became available on-line in 2008).

John C. Kerns (Bomhard—Kerns 1994:153—156) is considerably more specific than the others, not only about the location of the homeland of Nostratic but also about the Pre-Neolithic environment existing at the time. Therefore, we will quote him at length:

> I believe that Nostratic languages did not exist except as a part of Dene-Caucasian until the waning of the Würm glaciation, some 15,000 years ago. At this time the glacial ice began a rapid retreat all along the Northern fringe of Eurasia. In Europe, the effect was particularly dramatic, where the ice had been piled to impressive heights with moisture received from the Atlantic. Huge lakes developed from the melt water, particularly in the lowlands of Southern Russia, and new rivers were eroded into being, to both feed and drain the lakes,

and to drain the Northern slopes of Eurasia as they came into view. As the new lands emerged, sub-Arctic winds whipped up the dust of rocks, which had been ground by the movements of glacial ice, and carried it Southward into the newly emerging forests. Most of the dust was deposited in the valleys near rivers, forming the basis of the fertile loess soils that later proved so attractive to early Neolithic farmers with their techniques of slash and burn and their casual herding of domesticated animals. These people included the Chinese in Asia, and also the Indo-Europeans in the Balkans and later in Central Europe with the Linear Pottery expansion around 5000 BCE, and in the lands radiating Northward and Eastward from there.

By 10,000 BCE, the Northern half of Eurasia and North America had been transformed. Formerly glacial and sub-Arctic lands were now temperate forests; only the Circumpolar fringe was still Arctic or sub-Arctic. The great herds of large Arctic mammals had been replaced by more solitary game, and fish abounded in the lakes and streams. People of (ultimately) Aurignacian ancestry adapted their equipment and techniques to take advantage of the new opportunities. The small-blade stone working of the Aurignacians and their successors was refined and elaborated to provide a varied array of new tools and weapons by setting these "microliths" in handles of wood or antler. Greater use was made of bows and arrows (with microlith tips), and dogs were used in the hunt and for food. Fishing industries were established in the rivers and lakes, and particularly in the Baltic, involving nets, boats and bait lines.

As always in hunter-gatherer societies, mobility was at a premium. Canoes were used for water travel and snow shoes and sleds were developed for overland travel in winter. The conditions were favorable for the rapid spread of tribes and their new linguistic family over immense distances. This expansion, which is called Mesolithic, is indicated archaeologically by microliths found all along Northern Eurasia and Southward through the Caucasus into the Near East, where it later developed smoothly into the Neolithic with its domestication of cereals and of animals suitable for food and fibers.

The Mesolithic culture is aptly named, for it provided a gradual though rapid transition between the Upper Paleolithic and the agricultural Neolithic. There was, in fact, a steady advance in man's ability to control and exploit his environment. This point is brought out by Grahame Clark (1980).

The more I study the matter, the more I am convinced that the spread of the Nostratic speaking peoples was occasioned by the spread of the Mesolithic culture, for it occupied the right positions in time and space, and its characteristic features are compatible with the residual vocabulary of the Nostratic families — it was the last of the pre-agricultural eras in Eurasia.

Was the culture unilingual? I believe it was, in origin, though by the time the culture had spread into the more extreme areas — North Africa and Eastern Eurasia and North America — it had broken up into a catenation of mutually unintelligible, though closely related, languages, some of which eventually became ancestral to new linguistic families, including those comprising the Northern Nostratic sub-phylum we observe today. One reason for assuming a unitary origin is that certain features of vocabulary and morphology are shared between Eskimo-Aleut and Indo-European that occur only vestigially in the intervening families. This includes the heteroclitic declension. It also includes a few items of shared vocabulary such as Eskimo (Yupik) *alla* 'other' and *ingne*

'fire' (with a velar nasal in the first syllable). The paucity of such correspondences is analogous to the vestigial retention of radioactive atoms after the lapse of several half-lives.

Here, *ingne* is particularly interesting. It reminds us of Latin *ignis* 'fire'. The vowel in the first syllable is controversial since the corresponding vowels in the Lithuanian and Sanskrit words are respectively *u-* and *a-*, which cannot be reconciled with the Latin form or with each other by the accepted rules of phonological correspondence. This suggests that the ancestral word in Nostratic had the velar nasal in the first syllable, preserved in Yupik but perhaps lost sometime during the prehistory of Indo-European. Bomhard informs me that some Indo-Europeanists (cf. Ernout—Meillet 1979:308) have suggested that the Latin form may come from an earlier **ŋ̥gnis*, with a syllabic nasal in the first syllable.

I believe that the Mesolithic culture, with its Nostratic language, had its beginning in or near the Fertile Crescent just south of the Caucasus, with a slightly later northern extension into Southern Russia in intimate association with woods and fresh water in lakes and rivers. From these positions, it had ready access to the lower Danube and the Balkans (Indo-European), to the Caucasus (Kartvelian), south of the Caucasus into Mesopotamia, Palestine, Egypt, and the rest of North Africa (Sumerian and Afroasiatic), eastward into Central Siberia (Elamo-Dravidian), and northward and thence eastward along the Circumpolar fringe (Uralic-Yukaghir, Altaic, Chukchi-Kamchatkan, Gilyak, and Eskimo-Aleut). In the process of its expansion, it undoubtedly effected a linguistic conversion of many tribes of Dene-Caucasian or other origin; this accounts for the fact that non-Nostratic languages in Eurasia in historic times have been found mostly as relics in mountainous regions. Exceptions are Chinese and the now moribund or extinct Ket, which, together with Hattic and Hurrian, probably represent post-Nostratic reemergences of Dene-Caucasian speakers from their relict areas.

The Nostratic dispersion probably began at least 15,000 years ago, giving ample time for a plethora of eccentric linguistic developments unrecorded in history. By historic times — i.e., as late as the nineteenth century in many instances — the primordial features have been much diluted and transformed. Only by viewing the entire macrofamily holistically can we gain some idea of the features of the original Nostratic language; the importance of Indo-European in this is crucial in that it serves as an intermediate link, linguistically as well as geographically, between Kartvelian, Sumerian, and Afroasiatic on the one hand, and the Circumpolar group (Uralic-Yukaghir to Eskimo-Aleut) on the other. Besides, Indo-European seems to be fairly conservative in its syntactic system, its nominal declension, its pronouns, and its vocabulary in general.

At last we return to the issue I raised at the beginning of this section: Why does Indo-European resemble Afroasiatic in phonology and vocabulary, but the Circumpolar group in syntax and morphology? If the foregoing scenario is correct, or nearly so, it suggests that the Nostratic dispersal began almost as soon as its unity was formed; this is the inevitable result of the peripatetic activities of hunter-gatherers in an expansive situation. If we assume that the speakers of pre-Indo-European remained in the neighborhood of the Caucasus to a fairly late period (say 7500 BCE), with Afroasiatic already extending

> through Palestine into Egypt and eventually into the rest of North Africa, but with its Semitic branch still situated in Northern Mesopotamia high on the upper slopes of the Fertile Crescent, we would have an explanation for the similarity of vocabulary. That this proximity existed to a late period is suggested by shared words for field, bull, cow, sheep, and goat, animals which were then being domesticated in the Fertile Crescent. In addition, shared words for star and seven suggest a common veneration for that number and perhaps a shared ideology. This is speculative, of course, but if it is true it suggests an association that was social as well as geographical.
>
> Meanwhile, the Circumpolar families were developing in a situation that was geographically and environmentally separate. Here, the Mesolithic way of life has been maintained continuously to recent times; any impulses toward agriculture have been late, and except for the Finno-Ugrians, they all have been received from non-Indo-European sources. The linguistic developments have been equally idiosyncratic. In all of these families the SOV word order and associated morphological principles of early Indo-European have been retained except where subjected to alien influences in more recent times, and they have been maintained with special purity in Altaic and Elamo-Dravidian, which may well have been of Siberian origin. In vocabulary, they show little in common with Indo-European or Afroasiatic except at a strictly pre-agricultural level.
>
> In Uralic-Yukaghir, the linguistic idiosyncrasy is particularly marked. While the syntax and a considerable part of the morphology are basically conservative, the latter has been extended to an astonishing degree in several languages. But the most striking peculiarity of this family is the remarkable simplification that has developed in its consonantal system (reminiscent of Tocharian in Indo-European), and in the paucity of the Nostratic vocabulary that it has retained. It suggests a long isolation along the North Siberian fringe in the neighborhood of tribes not yet converted to Nostratic speech, for these features are less prominent in the other families of this group.
>
> By the same token, it also suggests that the similarities shared by Uralic with Indo-European, or Eskimo-Aleut are very likely to have been features of the original Nostratic since borrowing among these groups is excluded by their mutual isolation until much more recent times. Although the similarities are few as discernible at this late date, they are sufficiently striking that they are unlikely to have been due to independent developments.

Finally, the following quote is what the well-known Slavicist Henrik Birnbaum has to say about the Nostratic Hypothesis in general and about the Nostratic homeland in particular (Birnbaum 1992:25):

> If, in conclusion, I were to indicate my own position with regard to the still highly controversial issue of Nostratic, I would have to say that I have no difficulty in accepting the notion of a Nostratic macrofamily of languages comprising at least the six language families envisioned by Illič-Svityč and Dolgopol'skij. However, my understanding of such a macrofamily — and similar considerations would presumably apply to other large-scale language groups elsewhere in the world — would not, and could not, be based exclusively on evidence of genetic relationship as defined above. Linguistic macrofamilies (such as the one we term Nostratic) must, I submit, be viewed as

> the tangible result of both genetic relationships resulting from divergence and structural adjustments reflecting convergent trends in linguistic evolution. Consequently, and in line with some of the views propounded by Baudouin de Courtenay, Polivanov, and Trubeckoj, I would consider it fairly realistic to hypothesize a once actually spoken Nostratic ancestral language. Presumably, this language was characterized by a degree of inner cohesion comparable to what, *mutatis mutandis*, we can assume to have been the case with, say, Common Baltic or, possibly, Anatolian in their chronological and substantive development from Proto-Indo-European. And perhaps, if the heartland of Proto-Nostratic, as just qualified, is indeed to be identified with an area encompassing Transcaucasia, eastern (and southern) Anatolia, as well as the upper reaches of the Tigris and Euphrates, it would not be too far-fetched to assume secondary Indo-European protohomes in territories closer to the Black Sea, namely in the Pontic Steppe region, in northern and western Anatolia, and in parts of the Balkan Peninsula. This would further provide at least a point of departure for a reasonable explanation for the early settlement of the Greeks in mainland Greece and the archipelagos of the Aegean; for the formation of a secondary — if not tertiary — Indo-European core area focused in the Baltic region; and possibly even for the yet largely opaque earliest moves of Celtic tribes throughout Western, Central, and Southeastern Europe.

In my opinion, Kerns has hit the nail on the head (Bomhard—Kerns 1994:155): "I believe that the Mesolithic culture, with its Nostratic language, had its beginning in or near the Fertile Crescent just south of the Caucasus". Let us now reexamine the evidence from the Nostratic daughter languages and see how it leads to this conclusion.

The Indo-European homeland was most likely to the north of and between the Black and Caspian Seas. However, Nichols has convincingly argued that Pre-Proto-Indo-European originated in Central Asia and later spread westward to the North Pontic/Steppe zone that was the geographical location where Proto-Indo-European proper developed, where it began to split up into different dialect groups, and from which its descendants spread into Europe, the Iranian plateau, and northern India. Likewise, again as argued by Nichols, Pre-Proto-Uralic may be presumed to have originated in Central Asia and to have spread westward, following a more northerly route than Pre-Proto-Indo-European. Thus, it is likely that the Eurasiatic parent language was located in Central Asia and that it is to be dated roughly at about 9,000 BCE. This would mean that the eastern Eurasiatic languages (Altaic, Chukchi-Kamchatkan, Gilyak, and Eskimo-Aleut) must have spread eastward from Central Asia (more specifically, the area traditionally called "Western Turkestan") to their prehistoric homelands. Nichols has also speculated that Pre-Proto-Kartvelian may have originally been located in Central Asia, from which it spread westward along a southern route below the Caspian Sea to the Caucasus Mountains. The Elamo-Dravidian homeland may be placed roughly in western and central modern-day Iran and dated at about 8,000 BCE. Finally, following Militarëv and Shnirelman, the Afrasian homeland may be placed in the Middle East in the Levant and dated at about 10,000 BCE. Working backwards geographically and chronologically, we arrive at the only possible homeland for Proto-Nostratic,

namely, “the Fertile Crescent just south of the Caucasus”. For a candid assessment of these proposals, cf. Makkay 2004.

Thus, the following scenario emerges: The unified Nostratic parent language may be dated to between 15,000 to 12,000 BCE, that is, at the end of the last Ice Age — it was located in the Fertile Crescent just south of the Caucasus (see Map 4). Beginning around 12,000 BCE, Nostratic began to expand, and, by 10,000 BCE, several distinct dialect groups had appeared. The first to split off was Afrasian. One dialect group spread from the Fertile Crescent to the northeast, eventually reaching Central Asia sometime before 9,000 BCE — this was Eurasiatic. Another dialect group spread eastward into western and central Iran, where it developed into Elamo-Dravidian at about 8,000 BCE. If Nichols is correct in seeing Pre-Proto-Kartvelian as having migrated from Central Asia westward below the Caspian Sea to the Caucasus, this would seem to imply that Pre-Proto-Kartvelian had first migrated northeastward from the Fertile Crescent along with or as part of Pre-Proto-Eurasiatic, that it stopped somewhere along the way, and that it then returned to the Middle East. The early dispersal of the Nostratic languages is shown in Map 5.

Analysis of the linguistic evidence has enabled us to determine the most likely homeland of the Nostratic parent language, to establish a time-frame during which Proto-Nostratic might have been spoken, to date the disintegration of Proto-Nostratic, and to trace the early dispersal of the daughter languages. To round out the picture, let us now correlate the linguistic data with archeological data. During the last Ice Age (the so-called “Würm glaciation”), which reached its zenith about 18,000 to 20,000 years ago, the whole of northern Eurasia was covered by huge sheets of ice, while treeless steppe tundra stretched all the way from the westernmost fringes of Europe eastward to well beyond the Ural Mountains. It was not until about 15,000 years ago that the ice sheets began to retreat in earnest. When the ice sheets began melting, sea levels rose dramatically, and major climatic changes took place — temperatures rose, rainfall became more abundant, all sorts of animals (gazelles, deer, cattle, wild sheep, wild goats, wild asses, wolves, jackals, and many smaller species) became plentiful, and vegetation flourished. Areas that had formerly been inhospitable to human habitation now became inviting. Human population increased and spread outward in all directions, exploiting the opportunities created by the receding ice sheets. New technologies came into being — toward the end of the last Ice Age, hunter-gatherers had inhabited the Middle East, living either in caves or temporary campsites. As the Ice Age began coming to an end, more permanent settlements started to appear, and there was a gradual transition from an economy based on hunting and gathering to one based on cultivation and stock breeding. This was the setting in which Nostratic arose. Nostratic was indeed at the right place and at the right time. The disintegration of the Nostratic parent language coincided with the dramatic changes in environment described above, and Nostratic-speaking people took full advantage of the new opportunities.

Roaf (1990:18) has an interesting map showing the spread of agriculture in the ancient Middle East and beyond (see Map 6; see also Cavalli-Sforza et al. 1994:257 and Guilaine [ed.] 1989:118). It is striking how closely this map matches the early

dispersal of Nostratic languages as shown in our Map 4, though the time-frames are different — the language spread seems to have preceded the spread of agriculture by about three millennia, at least in Central Asia. It is tempting to speculate that the spread of agriculture may have been facilitated by the cultural contacts that seem to have been maintained among the speakers of the early Nostratic daughter languages (for more discussion, see the following section on Eurasiatic). There is, however, one very important exception, namely, the spread of agriculture into and throughout Europe, which could not have been in any way connected with the early dispersal of the Nostratic daughter languages, since Nostratic languages do not appear in Europe until a much later date. In what follows, I would like to offer a proposal to account for this.

Nostratic-speaking people were not the only population group in the Middle East at the time that the dramatic changes described above were taking place. To the north of the Fertile Crescent, in Anatolia and the Caucasus, there were non-Nostratic-speaking people (as evidenced by the later Hattic, Hurrian-Urartian, and, perhaps, Gutian [so Diakonoff 1990:63] in Anatolia), and these people were also active participants in the "Neolithic Revolution" and the resulting development and spread of agriculture and stock breeding. I suggest that these were the people responsible for the spread of agriculture into Europe, not early Nostratic-speaking people and definitely not Indo-Europeans as suggested by Renfrew. I further suggest that it was the migration of these ancient non-Nostratic-speaking agriculturalists into the Balkans that gave rise to the civilization of "Old Europe" (on Old Europe, see Paliga 1989; Gimbutas 1994). Thus, we can plot two distinct migrations into Europe: the earliest, which crossed from Anatolia into the Balkans and then spread northward into Europe, began about 10,000 years ago. I am proposing that this migration was by non-Nostratic-speaking agriculturalists. The second, which came from the Russian steppes and spread westward into Europe, began about 6,000 years ago. This migration was by Indo-European-speaking horsemen. As a result of this migration, Indo-European languages gradually replaced all of the earlier languages of Europe except for Basque.

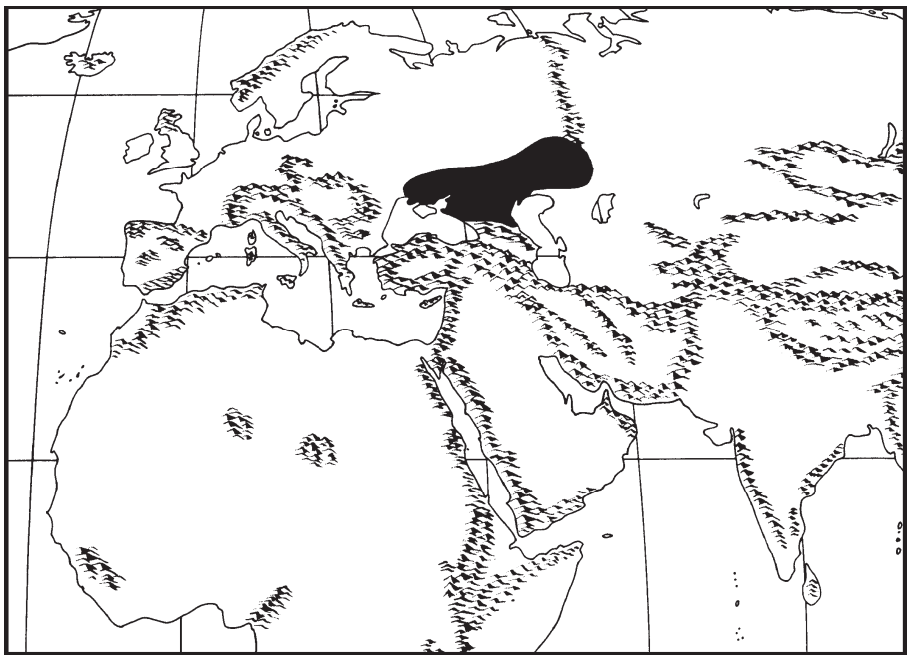
13.10. EURASIATIC

In the preceding section, I stated that the Nostratic dialect group which developed into Proto-Eurasiatic spread from the Fertile Crescent to the northeast, eventually reaching Central Asia sometime before 9,000 BCE. At the time of their arrival in Central Asia, the climate of the area was too dry to support primitive agriculture — it was not until the eighth millennium BCE that climatic conditions significantly improved. Therefore, we would expect to find no traces of agriculture in this region before this date, and indeed there are none. Nonetheless, there is evidence for early trade and cross-cultural contacts between northeastern Iran, Central Asia, and the Fertile Crescent dating as far back as Mesolithic times (cf. Sarianidi 1992:112—113). Moreover, in northeastern Iran, on the southeastern shores of the Caspian Sea, there is evidence that wild goats and sheep were hunted as early as the twelfth and

eleventh millennia BCE, and these were among the first animals to be domesticated. The earliest known Neolithic remains in northeastern Iran go back to about the seventh millennium BCE. By the sixth millennium BCE, Neolithic culture had spread northward into Central Asia — the Neolithic settlement patterns and technology (pottery, agriculture, stock breeding, etc.) appearing in this area were clearly imported from the Middle East (cf. Cavalli-Sforza et al. 1994:198). On the basis of this information, we may surmise that the earliest Nostratic-speaking people to appear in Central Asia were Mesolithic hunter-gatherers, not agriculturalists, though agriculture and stock breeding eventually followed. Even after the introduction of agriculture, there is evidence of different cultural traditions co-existing in the region, as noted by Sarianidi (1992:126):

> The culture of Neolithic agricultures and of cattle-breeders of Iran, Afghanistan and Soviet Central Asia shows that a transition to the forms of economy, usually termed the 'Neolithic Revolution', took place here almost simultaneously with similar developments in western Asia. A new way of life is clearly represented here by comfortable houses with accurate trimming of interiors, bright ceramics and wide use of ornaments. This qualitative leap in social development prepared the necessary base for the creation of ancient civilizations. At the same time inequalities in the course of historical development become clear: the ancient tribes of Iran and southern Turkmenistan passed to the new forms of economy, while in other areas of Soviet Central Asia and northern Afghanistan the transition was delayed. Tribes of hunters, fishers and food-gatherers, maintaining many archaic features in their culture, were contemporary with sedentary communities in oases. The lines of cultural links that emerged during the Palaeolithic epoch not only keep their importance but also become stronger — a fact which played an important role in the diffusion of cultivating cereals and of cattle-breeding.

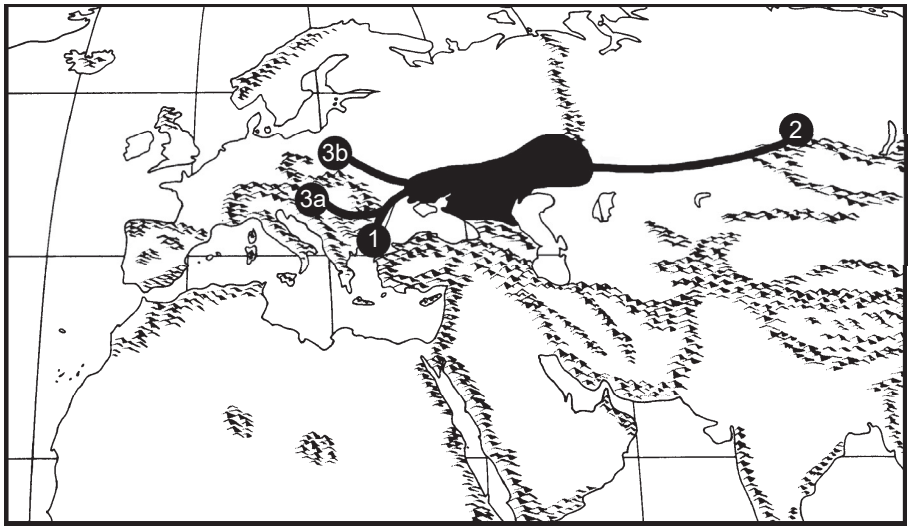
Map 1: The Indo-European Homeland



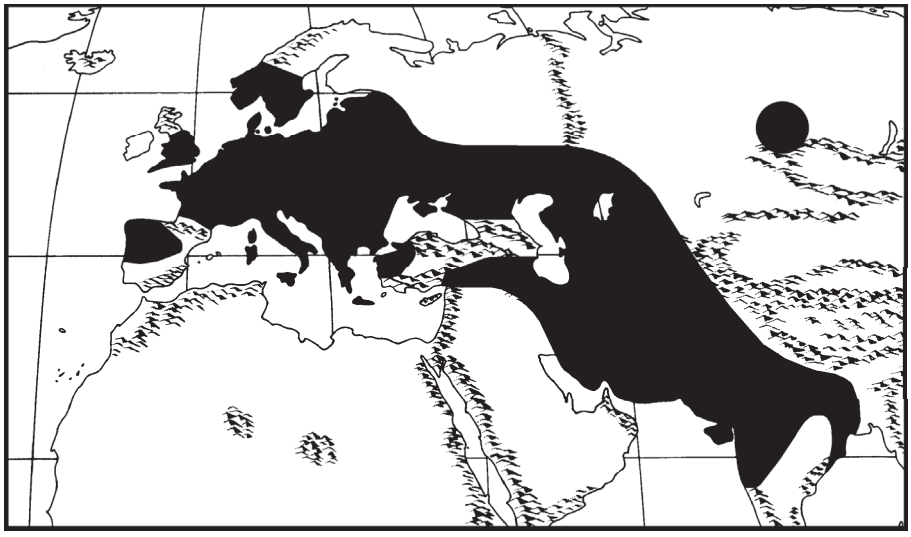
The shaded area shows the homeland of Indo-European-speaking people at about 5,000—4,500 BCE (cf. Anthony 2007:84, figure 5.1 [for the period between about 3,500—3,000 BCE]; Mallory—Adams 1997:299 [Homeland IX — the "Kurgan solution," which places the Indo-European homeland in the Pontic-Caspian steppelands around 4,500—2,500 BCE]; Villar 1991b:15). Anthony (2007:458), basing his views on the cumulative archeological evidence, including the most recent discoveries, concludes:

> Linguistic and archaeological discoveries now converge on the probability that Proto-Indo-European was spoken in the Pontic-Caspian steppes between 4500 and 2500 BCE, and alternative possibilities are increasingly difficult to square with the new evidence.

Maps 2a and 2b: The Dispersal of the Indo-European Languages

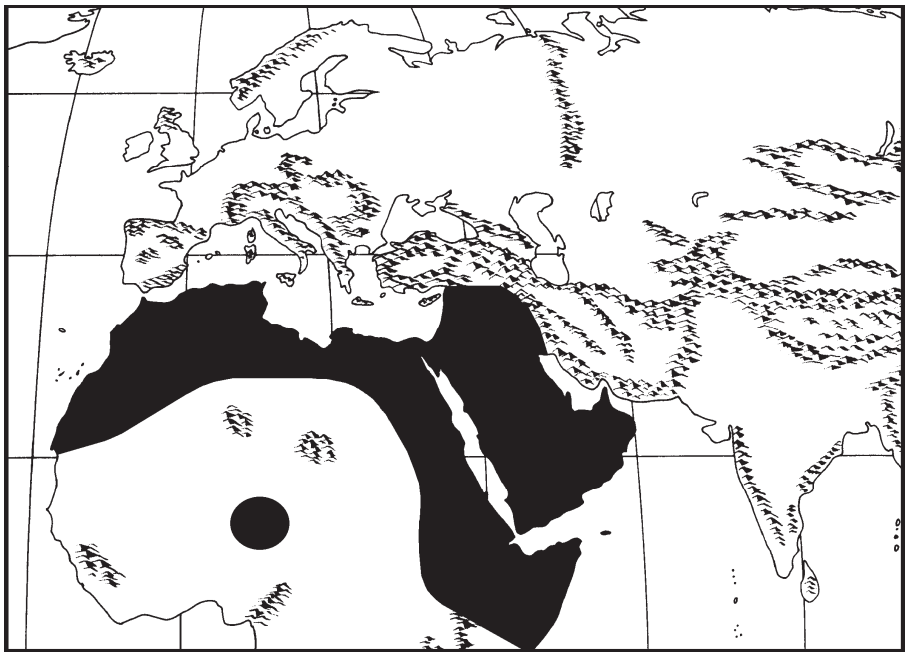


Map 2a: According to Anthony (2013:7), the first three migrations out of the Indo-European homeland are as shown above: (1) Anatolian; (2) Tocharian; (3a) Celtic; (3b) Germanic.



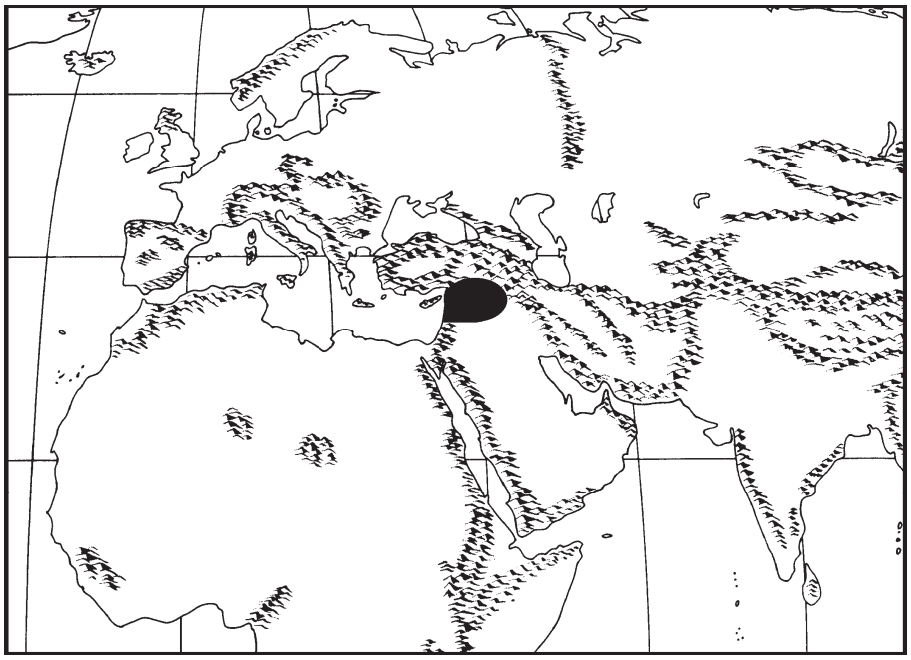
Map 2b: This map shows the approximate area to which Indo-European languages had spread by the first century BCE (cf. Mallory 1998:179; Villar 1991b:17).

Map 3: The Distribution of the Afrasian Languages at about 500 BCE



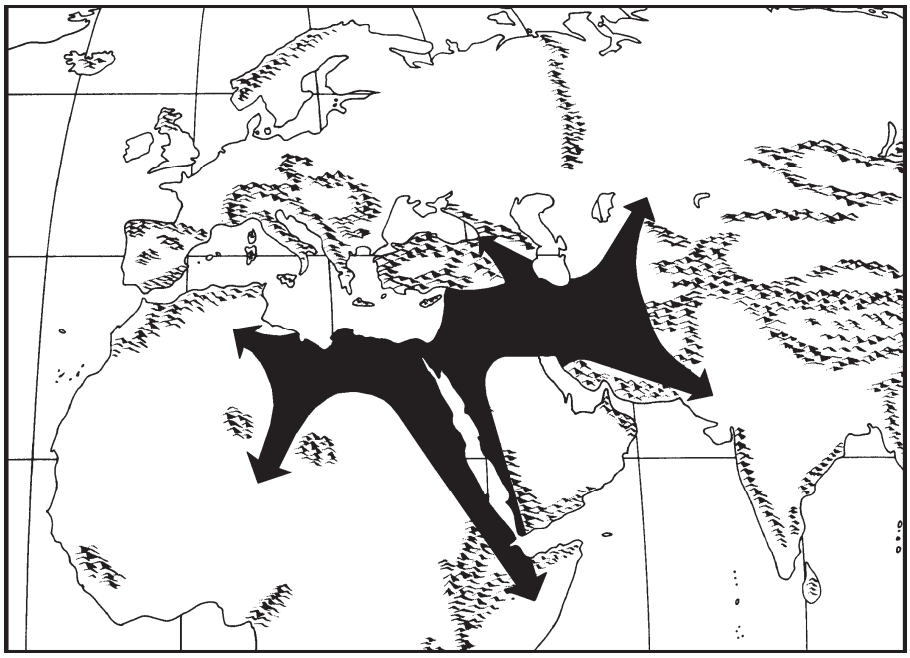
This map shows the approximate distribution of the Afrasian languages at about 500 BCE — it is adapted from the map facing page 1 in D. Cohen (ed.) 1998.

Map 4: The Nostratic Homeland



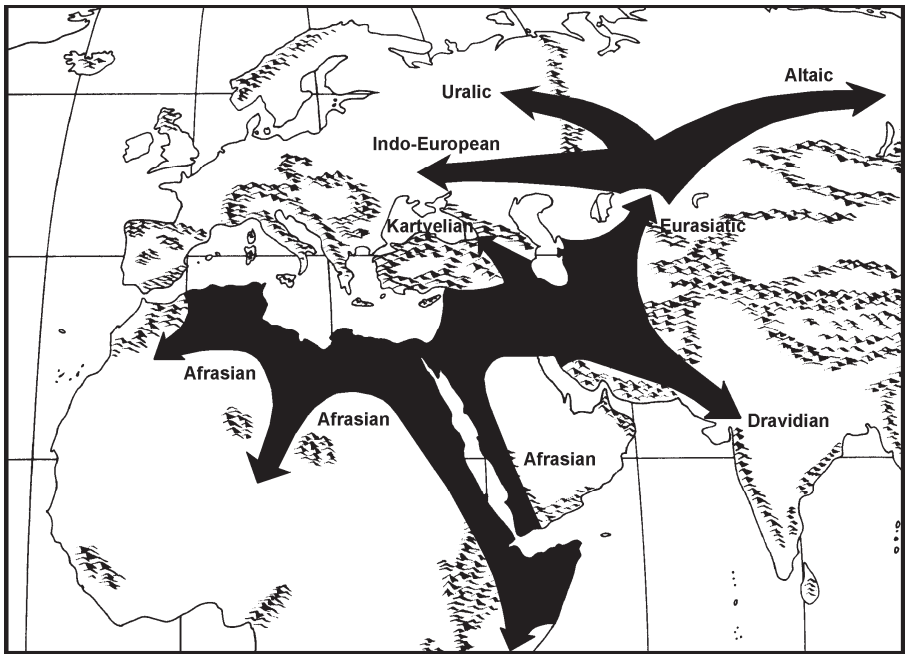
This map shows the approximate location of the Nostratic homeland at about 15,000 BCE.

Map 5a: The Early Dispersal of the Nostratic Languages



This map shows the approximate areas to which Nostratic languages had spread by about 8,000 BCE.

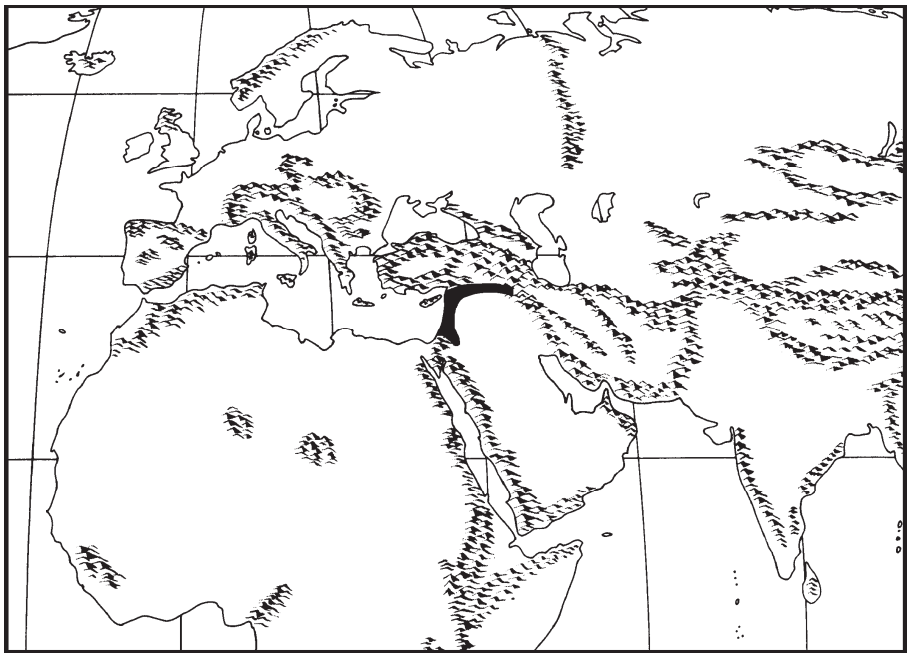
Map 5b: The Dispersal of the Nostratic Languages at about 5,000 BCE



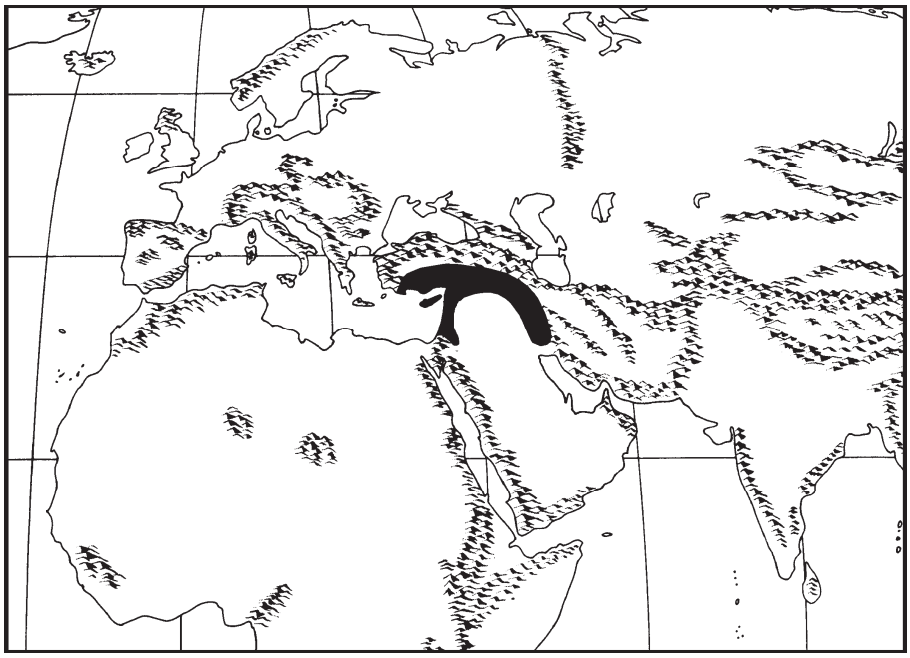
Note: Recent research conducted at the Harvard Medical School in the United States and the University of Tübingen in Germany has identified a genetic component in modern Europeans that is derived from Ancient North Eurasians. According to the new model, the Ancient North Eurasians entered Europe from the East and mingled with an exiting population composed of early farmers and still earlier hunter gatherers. Thus, nearly all modern Europeans have DNA from these three ancenstral groups: (1) hunter gatherers, (2) early farmers, and (3) Ancient North Eurasians. Moreover, "[t]he research team also discovered that ancient Near Eastern farmers and their European descendants can trace much of their ancestry to a previously unknown, even older lineage called the Basal Eurasians." This genetic model complements the linguistic dispersal scenario diagrammed in the above map for the Nostratic languages, especially as it relates to the entry of the Indo-Europeans into Europe. The full article was published in *Nature* (no. 513, pp. 409—413 [18 September 2014]).

See the maps on the following pages for the spread of agriculture.

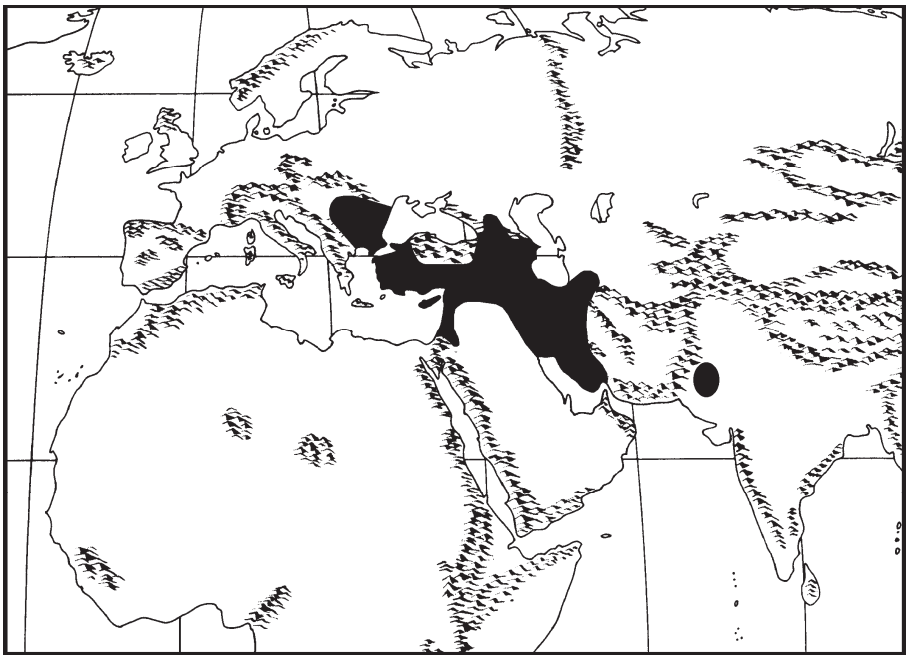
Map 6a: The Spread of Agriculture to 8,000 BCE



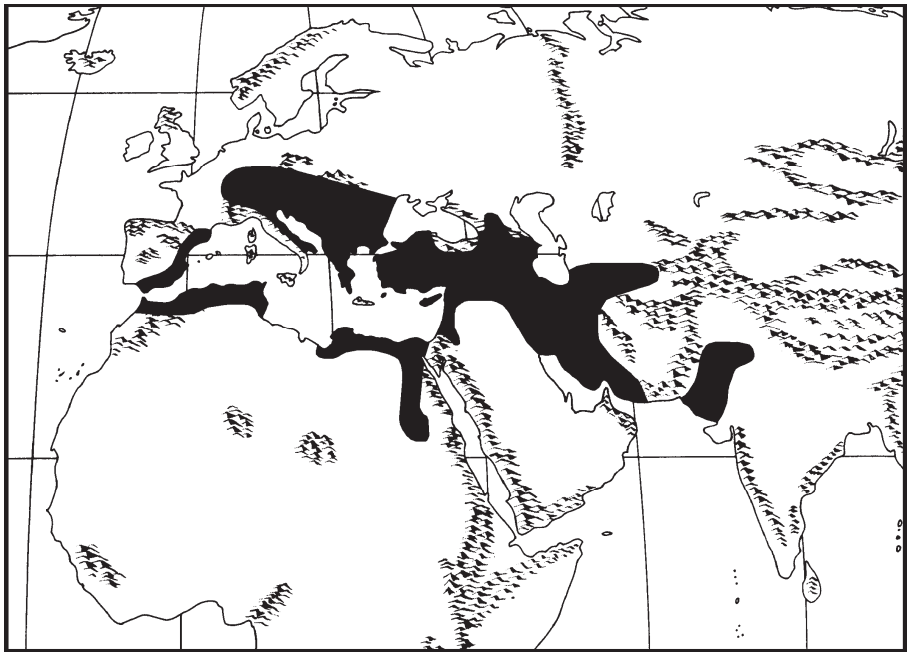
Map 6b: The Spread of Agriculture to 7,000 BCE



Map 6c: The Spread of Agriculture to 6,000 BCE



Map 6d: The Spread of Agriculture to 5,000 BCE



CHAPTER FOURTEEN

THE ORIGIN OF ETRUSCAN

14.1. INTRODUCTION

In spite of several heroic efforts, Etruscan has never been convincingly shown to be related to any known language or language family, except the poorly-attested Lemnian (spoken on the island of Lemnos) and Raetic (spoken in northeastern Italy in present-day Tyrol) (cf. Rix 1998b; Sverdrup 2002). This applies as well to recent attempts by Russian scholars to establish a connection between Etruscan and Northeast Caucasian (cf. Orël—Starostin 1990). And yet, there are some important clues as to the origin of Etruscan, and these need to be looked at in a new perspective. But, first, a few introductory comments need to be made.

Etruscan was spoken in central Italy, with the largest concentration of speakers being in the region now known as Tuscany. Recent research indicates that the Etruscans came to Italy from Anatolia, corroborating what the Greek historian Herodotus wrote (cf. Beekes 2003; John Hooper 2007; van der Meer 2004). The first written documents date from the 7th century BCE, while the latest date from the first century CE, which is probably not far beyond the time that Etruscan became extinct. Etruscan was usually written from right to left in an alphabet based mostly on Western Greek models (cf. Rix 2004:945). Though approximately 13,000 Etruscan inscriptions have been found, the overwhelming majority of them are extremely brief and consist mainly of formulaic inscriptions written on tombs and sarcophagi.

14.2. ETRUSCAN PHONOLOGY

The phonological system was simple: There were only four vowels, namely, *a*, *e*, *i*, *u*, and the consonant system distinguished a relatively small number of phonemes and lacked a voicing contrast in stops (φ, θ, χ were voiceless aspirates; *z* was a voiceless dental affricate).

Stops and affricates:	p		t	c (= k)
	φ (= p^h)		θ (= t^h)	χ (= k^h)
			z (= t͡s)	
Fricatives:	f	s	ś (= š?)	h
	v			
Nasals and liquids:	m	n	l	r

Around 500 BCE, Etruscan developed a strong stress accent on the first syllable of words. The result was that the vowels of non-initial, that is, non-stressed, syllables were gradually weakened and eventually lost. This led to an increase in the number of consonant clusters: cf., for example, *turuce* ‘gave’ > *turce*.

14.3. NOTES ON ETRUSCAN MORPHOLOGY

Unfortunately, the Etruscan inscriptions present an incomplete picture of Etruscan morphology. Nouns were divided into several declensions and distinguished the following cases (cf. Bonfante—Bonfante 2002:83; Cristofani 1991:54—62; Rix 2004:951—953):

Case	Endings
Nominative	-Ø
Accusative	-Ø, -n
Genitive	-(V)s, -(a)l
Dative	-ś(i), -ale, -ane, -i
Locative	-θi, -ti

Sample declension: *clan* ‘son’ (cf. Bonfante—Bonfante 2002:83):

	Singular	Plural
Nominative or accusative:	*clan*	*clenar*
Genitive:	*clans*	
Dative:	*clenśi*	*clenaraśi* *cliniiaras*
Locative:	**clenθi*	

There was also an archaic genitive ending *-n* (*-an*, *-un*), while a genitive ending *-(a)l* was frequently found on nouns ending in a velar or dental. Plural was usually indicated by adding the suffixes *-ar*, *-er*, *-ur*: cf. (singular) *clan* ‘son’, (plural) *clenar* ‘sons’. Gender is clearly indicated in personal names: masculine names end in a consonant or *-e*, feminine in *-a* or *-i*:

Masculine	Feminine
aule	*aula*, *aulia*
vel	*vela*, *velia*
seθre	*seθra*
arnθ	*arnθi*
larθ	*larθi*

A special form was used to indicate the patronymic. The general scheme was as follows:

Nominative	Genitive	Patronymic
larθ	*larθal*	*larθalisa*
arnθ	*arnθal*	*arnθalisa*
laris	*larisal*	*larisalisa*

We can venture a guess that the original meaning of *-al* was ‘belonging to’, so that *larθal* would have originally meant ‘belonging to Larth’. The patronymic can be seen as a hypercharacterized (“double genitive”) form in which the genitive ending *-isa* was added to the ending *-al*. The ending *-la* could be added again to the patronymic to indicate the grandfather: cf. *larθalisla* in the phrase *arnθ velimna aules clan larθalisla*, where Larth is the father of Aule and, therefore, the grandfather of Arnth. Interestingly, in this example, *aules* contains the genitive ending *-s*. Thus, we can render this loosely as ‘Arnth Velimna, son of Aule, belonging to Larth’ or, in better English, ‘Arnth Velimna, son of Aule, whose father was Larth’.

The cardinal numbers ‘one’ through ‘nine’ were most likely as follows (cf. Bonfante—Bonfante 2002:94—98; Cristofani 1991:76—79; Jatsemirsky 2007:1; Rix 2004:961; Glen Gordon 2008):

1 = *tu(n)*, *θu(n)*
2 = *zal* (*esal*)
3 = *ci*, *ki*
4 = *hut*, *huθ*
5 = *maχ*
6 = *śa*, *sa*
7 = *semφ*
8 = *cezp*
9 = *nurφ*

Bonfante—Bonfante (2002:96) give ‘four’ as *śa* and ‘six’ as *huθ*. However, this interpretation is questionable. As noted by Blažek (1999b:211 and 235) and Briquel (1994:329), support for considering *huθ* to be ‘four’ comes from its identification in the Pre-Greek name Ὑττηνία for the city Tetrapolis (Τετράπολις, composed of τέτρα- ‘four’ and πόλις ‘city’) in Attica. *semφ* ‘seven’ is usually considered to be a loan from Indo-European. The tens (other than *zaθrum* ‘twenty’) are formed from the simple numbers by adding the element *-alχ-*: *cealχ-*, *cialχ-* ‘thirty’; **huθalχ-* ‘forty’; *muvalχ-* ‘fifty’; *śealχ-* ‘sixty’ (Lemnian *śialχv-*); *semφalχ-* ‘seventy’; *cezpalχ-* ‘eighty’; **nurφalχ-* ‘ninety’. According to Jatsemirsky, the number ‘ten’ may have been *halχ*, not *śar*/*zar*, which he interprets as ‘twelve’ instead.

Adjectives formed a distinct morphological category in Etruscan. Three types of adjectives were distinguished: (1) adjectives of quality, (2) adjectives of possession or reference, and (3) adjectives expressing a collective idea. In general, adjectives were indeclinable.

The following personal pronouns are known (cf. Rix 2004:955):

First person:	*mi* 'I', (acc. sg.) *mini* 'me'
Second person:	**u* 'you', (acc. sg.) *un*, (dat. sg.) *une*; (acc. pl.) *unu*
Third person:	
Personal:	*an* (*ana*, *ane*, *anc*, *ancn*, *ananc*) 'he, she; this, that'
Inanimate:	*in* (*inc*, *ininc*) 'it'

The following demonstrative, relative, and indefinite pronouns existed:

Demonstrative:	*ca*, *ta* (*ita*), *cen*, *cn*, *eca* (*ica*), *ek*, *tn*; *itun* (emphatic) 'this'
Relative:	*ipa*, *an* 'who, which; where'
Indefinite:	*ipe*, *ipa* 'whoever'

Verb morphology is even less completely understood. The past passive ending, for both first and second persons, was *-χe*, while the third person past active ending was *-ce*, as in *turce* 'gave'. The second person imperative endings were *-t*, *-θ*, *-θi*. There was an active past participle ending in *-θas*, while present participles were formed with an ending *-an*.

The following conjunctions and adverbs may be noted:

-c 'and' (this is most likely an Indo-European loan)
-m (*-um* after consonants) 'and'
sve 'likewise'
ic, *iχ*, *iχnac* 'how, as'
etnam 'also; again'
ratum 'according to ritual' (Latin loan)
θuni 'at first'
(e)nac 'then, after; how, as, because, since'
matam 'before, earlier'
epl, *pul* 'until'
θui 'now; here'
une 'and then' (?)
hinθin 'from below'
ipa 'where'
θar 'there, thither'
eθ, *et* 'thus, in this way'

14.4. CLUES ABOUT THE ORIGIN OF ETRUSCAN

Although only a relatively small portion of the Etruscan vocabulary is known (cf. Briquel 1994:328—329), even that small sample contains unmistakable Nostratic elements, including the personal pronouns *mi* 'I', and *mini* 'me', the demonstrative pronouns *eca*, *ca* 'this' and *ita*, *ta* 'this', and several lexical items such as, for example:

Etruscan	Nostratic
maθ 'honey, honeyed wine'	A. Proto-Indo-European *med^hu 'honey, mead' (cf. Sanskrit *mádhu* 'sweet drink, anything sweet, honey'); B. Proto-Finno-Ugrian **mete* 'honey' (cf. Finnish *mesi* 'nectar, honey'); C. Proto-Dravidian **maṭṭu* 'honey, nectar, toddy' (cf. Tamil *maṭṭu* 'honey, toddy, fermented liquor, sweet juice, etc.').
apa 'father'	A. Indo-European (cf. Gothic *aba* 'man, husband'); B. Proto-Afrasian **ʔab-* father, forefather, ancestor' (cf. Akkadian *abu* 'father'; Tawlemmet *abba* 'father'; Sidamo *aabb-o* 'father'); C. Proto-Dravidian **appa-* 'father' (cf. Tamil *appaṉ*, *appu* 'father'); D. Proto-Altaic **aba* 'father' (cf. Written Mongolian *abu* 'father').
hanθin 'in front of, before'	A. Indo-European (cf. Hittite *ḫanti* 'facing, frontally, opposite, against', *ḫanza* 'in front'; Sanskrit *ánti* 'in front of, before, near'; Latin *ante* 'before'; Greek ἄντα 'over against, face to face', ἀντί 'over against, opposite'); B. Afrasian (cf. Egyptian *ḫnt* 'face, front part; in front of').
pi (also *pul*) 'at, in, through'	A. Indo-European (cf. Gothic *bi* 'about, over; concerning, according to'; Old English *bī*, *bi*, *be* '[of place] near, in, on, upon, with, along, at, to; [of time] in, about, by, before, while, during; for, because of, in consideration of, by, by means of, through, in conformity with'; Sanskrit [with prefix] *a-bhí* 'to, towards'); B. Afrasian (cf. Proto-Semitic **ba* ~ **bi* 'in, with, within, among'); C. Sumerian *bi* 'with, together with, in addition to'.

θar ‘there, thither’	A. Proto-Indo-European *$t^h\check{e}$-*r*, *$t^h\check{o}$-*r* ‘there’ (cf. Sanskrit *tár-hi* ‘there’; Gothic *þar* ‘there’; Old High German *thar* ‘then, there’; Old English *þāra*, *þǣr* ‘there’); B. Altaic (cf. Lamut / Even *tar* ‘yonder, the one yonder’).
-m (*-um*) ‘and’	A. Afrasian (cf. Semitic: Ugaritic ʿ*m* (= ʿ*amma* ?) ‘with, to’ (also ʿ*mn*); Hebrew ʿ*im(m-)* [עִמּ-/עִם] ‘with, together with’; Syriac ʿ*am* ‘with’; Aramaic ʿ*im(m-)* ‘with’; Arabic *maʾa* ‘with, together with, accompanied by, in the company of’, *maʾan* ‘together, at the same time, simultaneously’; East Cushitic: Hadiyya *-m* ‘too, also’; Chadic: Hausa *ma* ‘also, too, even’); B. Proto-Dravidian coordinating formant *-*um*; C. Indo-European (cf. Gothic *miþ* ‘with, among’; Old English *mid*, *miþ* ‘together with, with, among’; Middle High German *mite*, *mit* ‘with, by, together’; Old Icelandic *með* ‘with, along with, together with’; Greek μετά ‘[with gen.] in the midst of, among; [with dat.] among, in the company of; [with acc.] into the middle of, coming among’); D. Chukchi comitative suffix *-ma*; E. Sumerian *-m-* conjunctive prefix and *-m-da-* third person singular comitative prefix inanimate.
te- ‘to put, to place’	A. Afrasian (cf. Proto-Semitic **day-* [**wa-day-*, **na-day-*] ‘to cast, to throw, to put, to place’ > Hebrew *yāðāh* [יָדָה] ‘to throw, to cast’; Akkadian *nadū* [Old Akkadian *nadāʾum*] ‘to cast [down], to lay[down], to throw; [stative] to lie, to be situated’; Geez / Ethiopic *wadaya* [ወደየ] ‘to put, to put in, to add, to put on [adornments], to put under, to place, to set, to throw, to cast’); B. Proto-European (*d^heyC- >) *$d^h\bar{e}$- ‘to set, to lay, to put, to place’ (cf. Sanskrit [reduplicated] *dá-dhā-ti* ‘to put, to place, to set, to lay [in or on]; to appoint, to establish, to constitute’; Greek [reduplicated] τί-θη-μι ‘to set, to put, to place’).

There is also a pronoun *θi*, whose meaning is unknown, but which resembles the Nostratic 2nd singular personal pronoun. That *θi* may, in fact, have been a form of the 2nd singular personal pronoun finds support in the verbal 2nd person imperative endings *-ti*, *-θ*, *-θi* (though it must be noted here that the 2nd person personal pronoun is attested in the Zagreb mummy wrappings as **u* ‘you’). There is a widespread plural marker *-*r* in the Nostratic daughter languages — it shows up,

for example, in the Proto-Dravidian plural marker *-*(V)r* used with nouns of the personal class and pronouns. In Manchu, there is a plural in -*ri*, which is used with certain kinship terms. Moreover, Benzing reconstructs a Proto-Tungus *-*ri* as the plural marker of reflexive pronouns. Within Kartvelian, Svan has a plural ending -*är*. In Upper Bal, this is changed to -*äl*, but in Lower Bal, -*är* has mostly been generalized. The Chukchi first and second person plural personal pronouns *mu-ri* 'we' and *tu-ri* 'you', respectively, contain the plural marker -*ri*. Finally, a plural marker -*r* is also found in Omotic, within Afrasian: cf. the typical Zayse plural suffix -*ir* in, for example, *šóoš-ir* 'snakes' (singular *šóoš* 'snake'). These forms may be compared with the Etruscan plural suffixes -*ar*, -*er*, -*ur*.

But, there is more. The declensional system is reminiscent of Indo-European, and verb morphology, though poorly known, also exhibits Indo-European characteristics. According to Georgiev (1981:232—233), there were five noun stem types in Etruscan: (A) stems ending in -*a*, with genitive singular in -*as* or -*aś*; (B) stems ending in -*i*, with genitive singular in -*is*, -*ias*, or (rarely) -*aias*; (C) stems ending in -*ai*, with genitive singular in -*ias* or -*aias*; (D) stems ending in -*u*, with genitive singular in -*us*; and (E) consonant stems, with genitive singular in -*as* or (later) -*s*. These correspond to similar stem types in Indo-European. Moreover, the genitive singular in -*s* is typically Indo-European. Etruscan also had an archaic genitive in -*n* (-*an*, -*un*), which corresponds to the Indo-European genitive plural in *-*om* (also with long vowel: *-*ōm*, contracted from *-*o-om*). In demonstrative stems, the accusative ends in -*n*, and this also has a correspondence with the Indo-European accusative singular ending *-*om* (note: the change of final -*m* to -*n* occurs in several Indo-European daughter languages). The locative in -*ti*, -*θ(i)* has parallels in Anatolian (Hittite ablative singular -*az*, -*aza* [*z* = /t͡s/], instrumental singular -*it*; Luwian ablative-instrumental singular -*ati*; Palaic ablative-instrumental singular -*at*; Lycian ablative-instrumental singular -*edi*, -*adi*) and in other Nostratic languages, such as the Uralic ablative ending *-*ta*. The active past participle ending in -*θas* is reminiscent of the Proto-Indo-European suffix *-*t*^{h}*o-s* found, for example, in Sanskrit in (past participle passive) *śru-tá-ḥ* 'heard' and in Greek in κλυτός 'heard of, famous, renowned, glorious' (cf. Burrow 1973:370—371; Szemerényi 1996: 323—324), while the present participle ending in -*an* also has parallels in Indo-European.

There are also several remarkable lexical parallels with Indo-European, a few examples being:

Etruscan	Indo-European
-*c* 'and'	Sanskrit -*ca* 'and'; Latin -*que* 'and'
semφ 'seven'	Latin *septem* 'seven'; Sanskrit *saptá* 'seven'
tin 'day, Jupiter'	Sanskrit *dína-m* 'day'; Old Church Slavic *dьnь* 'day'

tiu, *tiv-*, *tiur* ‘moon, month’	Same stem as in Sanskrit *dívasa-ḥ* ‘heaven, day’, *divyá-ḥ* ‘divine, heavenly, celestial’; Latin *diēs* ‘day’
neri ‘water’	Sanskrit *nārāḥ* ‘water’, *Narmadā* the name of a river
θam- ‘to build, to found’ and *tmia* ‘place, sacred building’	Same stem as in Latin *domus* ‘house, home; dwelling abode’; Sanskrit *dáma-ḥ* ‘house, home’; Greek δέμω ‘to build, to construct’
an (*ana*, *ane*, *anc*, *ananc*) ‘he, she’	Sanskrit demonstrative stem *ana-* ‘this’; Hittite demonstrative *anniš* ‘that, yonder’; Lithuanian demonstrative *anàs* ‘that one (over yonder)’
car-, *cer-* ‘to make, to build’	Sanskrit *kárati* ‘to do, to make, to perform, to accomplish, to cause, to effect, to prepare, to undertake, to work at, to build’ (cf. Pokorny 1959:641—642 **k^{u}er-* ‘to make, to form’)

While some of these may be borrowings (*-c* ‘and’ and *semφ* ‘seven’, for example), others (*an* ‘this’, for instance) are native Etruscan words. The following is also a borrowing: *neftś*, *nefś*, *nefiś* ‘grandson’ (< Latin *nepos* ‘grandson’).

14.5. CONCLUSIONS

These and other similarities are discussed in detail in articles by Adrados (1989a and 2005a) and Woudhuizen (1991). Adrados draws the conclusion that Etruscan is an archaic Indo-European language and that it is particularly close to the languages of the Anatolian branch. Woudhuizen reaches a similar conclusion, as did Georgiev (1979) before them. In my opinion, Adrados and Woudhuizen have indeed shown that Etruscan is related in some way to Indo-European, but not as a daughter language. The question then arises, if Etruscan is not an Indo-European daughter language, then what is the nature of its relationship to Indo-European and, further, to Nostratic?

Until fairly recently, Etruscan was considered to be a language isolate, with no known relatives. However, this view is no longer tenable. As noted at the beginning of this chapter, Etruscan is now known to be related to Raetic and Lemnian (cf. Rix 2004:944). Together, these three form the Tyrrhenian language family. Hence, when looking for possible relatives of Etruscan, we need to think in terms of Tyrrhenian as a whole rather than working with a single branch of this language family. Unfortunately, Proto-Tyrrhenian has not yet been reconstructed. Rix (2004:944) calls the parent language Proto-Tyrsenic and dates it to the last quarter

of the second millennium BCE. He further notes that the location of its homeland is disputed.

The striking similarities between Tyrrhenian (only Etruscan has been compared to date, not reconstructed Proto-Tyrrhenian) and Indo-European presented in this chapter and by several other scholars are real, as are the similarities between Tyrrhenian and other Nostratic languages. These similarities point to genetic relationship. Thus, the following hypothesis may tentatively be proposed: The Tyrrhenian language family is a separate branch of Eurasiatic, closest to Indo-European. Eurasiatic, in turn, is a branch of the Nostratic macrofamily. Future research must be directed toward testing the validity of the conclusions reached in this section, especially in light of the growing body of literature on Nostratic.

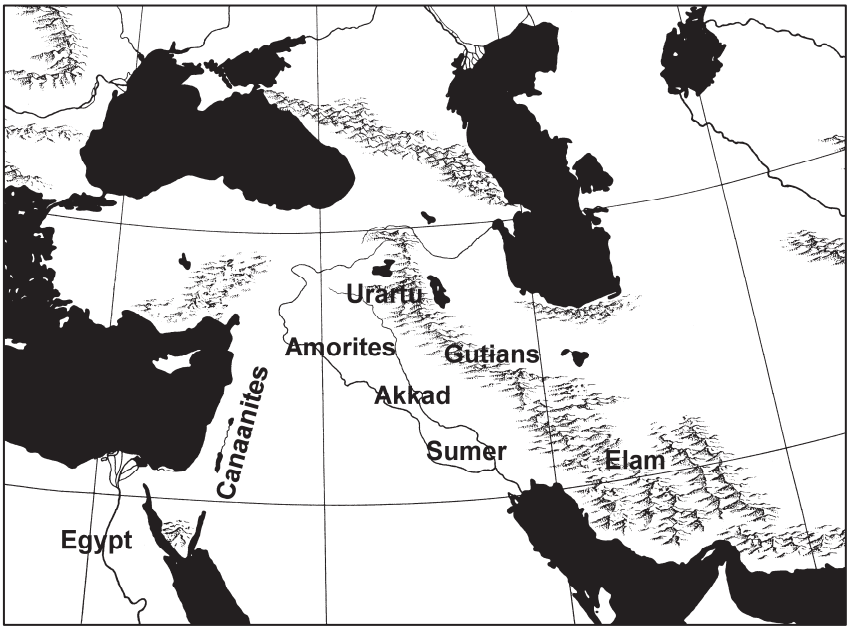
References: Barker—Rasmussen 1998; Beekes 2003; Briquel 1994; D'Aversa 1994; Larissa Bonfante 1990; Bonfante—Bonfante 1983 and 2002; Cristofani 1991; Facchetti 2005; Georgiev 1979 and 1981:229—254 (these works must be used with caution); Glen Gordon 2008; Jatsemirsky 2007; Perrotin 1999; Pfiffig 1969; Rix 1998b and 2004; Stoddart 2009; Sverdrup 2002.

CHAPTER FIFTEEN

SUMERIAN AND NOSTRATIC

15.1. INTRODUCTION

Sumerian, which is now extinct, was spoken in southern Mesopotamia (modern-day Iraq), extending from Babylon in its northernmost limits to the tip of the Persian Gulf in the south (see map below). From the time of the earliest texts, several dialects can be distinguished, the most important of which was Emesal (*eme-sal*), most probably "women's speech", which Boisson (1992:434—435) argues was more conservative than the main dialect, Emegir (*eme-g̃ir*$_{17}$). The earliest Sumerian inscriptions date from around 3,100 BCE, though the oldest intelligible texts date from about 2,600 BCE, and the language was probably still spoken as late as the 3rd century BCE. The Sumerian writing system was based exclusively on the cuneiform syllabary, which exhibits several marked stages of development over the course of Sumerian literary history. After about 1,900 BCE, Akkadian (a Semitic language) began to replace Sumerian in letters and administrative texts, though Sumerian continued to be used in cultic and literary texts.



Map 7: The Location of Sumerian

Sumerian shares a number of interesting lexical parallels with the Nostratic languages (these are listed in several papers by Boisson, in Bomhard—Kerns 1994: 195—714, and in Chapter 22, Part III: Comparative Vocabulary, of this book), including some core vocabulary items such as pronominal stems, though there are important differences here as well. Thus, Sumerian *may* in some way be related to the Nostratic languages. In a number of privately-circulated papers, Claude Boisson has explored lexical parallels between Sumerian and Dravidian, while Anumugam Sathasivam (1965), in an unpublished manuscript, has tried to show that Sumerian is related to Dravidian. Though I formerly very tentatively accepted a modified version of Sathasivam's (and Boisson's) theories, placing Sumerian as a sister to Proto-Elamo-Dravidian, I am not entirely satisfied with this arrangement. True enough, Sumerian has an agglutinating morphological structure, as do Elamite and Dravidian, and the nominal case endings, for example, are, in reality, bound postpositions in both Sumerian and Elamo-Dravidian. However, Sumerian is sufficiently different from both Elamite and Dravidian to make me question that there was a special relationship between them.

15.2. NOTES OF SUMERIAN MORPHOLOGY

Before beginning, we should give a brief sketch of Sumerian grammatical structure, noting first and foremost that, even after more than a century of intensive study, there is still not widespread agreement among experts in the field on many fundamental questions of Sumerian grammar. Nevertheless, the overall structure is clear. Three word classes were distinguished: (A) nouns, (B) verbs, and (C) adjectives. Even though grammatical gender in the strictest sense did not exist, nouns fell into two classes, namely, animate and inanimate, which were only distinguished in the 3rd person actor verbal and possessive pronoun affixes and in the relative pronoun. Ten cases (genitive, absolutive, ergative, dative, locative, comitative, terminative, ablative-instrumental, and equative [in nouns] plus subject case [in pronouns only]) and two numbers (singular and plural) were distinguished. The plural was indicated by means of the suffix *-ene*, which was used only with animate nouns, or by reduplication. In later texts, the plural could also be indicated by the form *hi-a*, which was used with inanimate nouns and which was originally an independent word meaning 'mixed, various, unspecified', or by *-me-eš*, which was properly the enclitic copula with plural suffix. Sumerian differentiated between ergative and absolutive in nouns. In pronouns, however, the patterning was that of a nominative-accusative system (so Thomsen 1987:51, §42; Hayes 1997a:28—30; and Michalowski 1992:96; Diakonoff, however, disputes this [personal communication]). Sumerian verbs were formed by adding various prefixes and/or affixes directly to the verbal root, which was itself invariable. Verbal constructions fell into one of two categories, namely, finite forms or non-finite forms. Finite verbal stems distinguished three conjugational types: (A) the intransitive conjugation, (B) the transitive *hamṭu* conjugation, and (C) the transitive *marû* conjugation. Intransitive forms were noted by means of pronominal suffixes, while transitive forms were

noted by means of either prefixes, suffixes, or both. Syntactically, the basic word order was SOV.

15.3. SUMERIAN PHONOLOGY

The Sumerian cuneiform syllabary distinguished the following sounds:

p	t		k	
b	d		g	
	s	š		h
	z			
m	n		g̃ (= [ŋ])	
	l			
	r			
*w		*y		
a	e	i	u	(o ?)

There may have been corresponding long vowels as well. There were no initial consonant clusters, while final consonants, especially *t*, *d*, *k*, *g*, *m*, *n*, and *r*, were often omitted in the writing (cf. Thomsen 1987:43), and this often makes it difficult to ascertain the form of the word. Internally, there was a tendency for consonants to assimilate. The traditional transliteration shows a voicing contrast in stops. There is a very strong probability, however, that the actual contrast was between voiceless aspirated versus voiceless unaspirated or simply between tense versus lax (cf. Boisson 1988b:215—19; Hayes 1997a:12; Thomsen 1987:43): thus, traditional *p*, *t*, *k* = p^h, t^h, k^h respectively, while traditional *b*, *d*, *g* = *p*, *t*, *k* respectively. Traditional *z* may have been an affricate (cf. Boisson 1989b:221—26). Though the semivowels /y/ and /w/ were not directly represented in the writing system, there is indirect orthographic evidence of their existence. The vowels have also drawn the attention of several scholars. It is possible that Sumerian may have had more vowels than what are directly represented in the writing system — in particular, a strong case has been made for an *o*-quality vowel. Other proposals, however, are much more controversial and have not won wide support. Lastly, Boisson (1989b:212—214) considers Bauer's proposed d^r (cf. Hayes 1997a:12—13; Thomsen 1987:44) to be highly questionable. For a discussion of the problems involved in interpreting Sumerian phonetics and phonology, cf. Diakonoff 1992:125—129; Edzard 2003: 13—21; Hayes 1997a:7—15; Jagersma 2010:31—67.

The Sumerian root was generally monosyllabic: *V*, *CV*, *VC*, and, most often, *CVC*. There was no distinction between verbal roots and nominal roots — thus, for example, *dùg* could mean either 'good' or 'to be good'.

In the Sumerian texts, certain non-standard forms of speech can be discerned. It is not entirely clear what this means — perhaps different dialects, perhaps not; perhaps so-called "refined speech", perhaps not. These forms, which have been

encountered mostly in religious texts, were labeled "Emesal" (*eme-sal*) by the scribes, while the standard forms were labeled "Emegir" (*eme-g̃ir*$_{17}$) (*eme* means 'speech, language').

15.4. CLUES ABOUT THE ORIGIN OF SUMERIAN

To illustrate the problems involved in trying to determine the origin of Sumerian, let us begin by looking at the differences between the case endings reconstructed for Proto-Elamo-Dravidian by McAlpin (1981:111) with those found in Sumerian (cf. Thomsen 1987:88—89):

A. Proto-Elamo-Dravidian:

Nominative	*-*Ø*
Accusative	*-*(V)n*
Adessive/ Purposive (Dative)	*-*əkkə* (?)
Genitives:	
1. Possessive	*-*a*
2. Adnominal	*-*in*
3. Oblique/Locative	*-*tə*

B. Sumerian:

	Postpositions / "case endings"		
Case	Animate	Inanimate	Prefix Chain
Genitive	*-ak*	*-ak*	
Absolutive	*-Ø*	*-Ø*	
Ergative	*-e*	*-e*	
Dative ("to, for" — animate only)	*-ra*		*-na-*, etc.
Locative ("when")		*-a*	*-ni-*
Comitative ("with")	*-da*	*-da*	*-da-*
Terminative ("to")	*-šè*	*-šè*	*-ši-*
Ablative ("from")-Instrumental		*-ta*	*-ta-* and *-ra-*
Locative-Terminative		*-e*	*-ni-*
Equative ("like, as")	*-gin*$_7$	*-gin*$_7$	

The prefix chain cases require special explanation (I will quote from Thomsen 1987:215 and 219 [for the dative, §431 below]):

§ 423. Some cases, the so-called dimensional cases, can be incorporated in the prefix chain of finite verbal forms. These cases are: dative, comitative, terminative, ablative, and locative. In principle the case elements have the same shape as the corresponding postpositions and only minor changes in writing and pronunciation occur.

The rank of the case elements in the prefix chain is between the conjugation prefixes and the pronominal element serving as subject/object mark...

§ 424. *Terminology*

The case elements of the prefix chain are most often called 'infixes' or 'dimensional infixes' by the sumerologists. However, since they do not act as infixes in the stem but merely as members of the chain of grammatical elements preceding a verbal root, 'case elements' or 'case prefixes' are used here as the most appropriate terms.

§ 431. The dative is the only case prefix which has different prefixes for every person...

1.sg.	ma- < /mu-a-/	1.pl.	-me-
2.sg.	-ra-	2.pl.	?
3.sg.an.	-na- < /-n-a-/	3.pl.	-ne-

There are parallels, to be sure, but as many with *other* Nostratic languages as with Elamo-Dravidian. The Sumerian ablative-instrumental case ending (inanimate) *-ta*, (prefix chain) *-ta-* agrees with the Proto-Uralic ablative ending **-ta* as well as with the Proto-Elamo-Dravidian oblique/locative ending **-tə*. The Sumerian locative case ending (prefix chain) *-ni-* is similar to the Proto-Uralic locative case ending **-na*, though the vowels are problematic, and to the Proto-Dravidian locative case ending **-in*(/**-il* ?). The Sumerian genitive case ending *-ak* is similar in form to the Proto-Dravidian dative case ending **-(k)ku* and the Proto-Elamo-Dravidian adessive/locative (dative) **-əkkə*, but the difference in function is a problem. Moreover, the *-na-* and *-ni-* prefix chain case endings may be somehow related to the oblique-*n* formations described by John C. Kerns (cf. Bomhard—Kerns 1994: 173—179, §3.5.3.1).

An extremely interesting parallel involves the Sumerian comitative element *da* (also *-dè*). As noted by Thomsen (1987:99): "The basic meaning of the comitative is 'with', 'together with', expressing accompaniment as well as mutual action." A particle **da* (~ **də*), with the basic meaning 'along with, together with, in addition to', shows up all over Nostratic (cf. Bomhard—Kerns 1994:275—276, no. 89). It appears in Kartvelian as a conjunction: Georgian *da* 'and', Mingrelian *do* 'and', Laz *do* 'and' < Proto-Kartvelian **da* 'and', and probably as the adverbial case ending *-ad*/*d* found, for example, in Old Georgian (in Modern Georgian, the ending is *-ad[a]*). In Afrasian, it is found in Chadic: Hausa *dà* 'with; and; by, by means of; regarding, with respect to, in relation to; at, in, during; than'; Kulere *tu*; Bade *də*; Tera *ndə*; Gidar *di*; Mokulu *ti*; Kanakuru *də* < Proto-Chadic **də* 'with, and'.

According to Diakonoff (1988:61), a comitative/dative in *-*dV*, *-*Vd* is to be reconstructed for Proto-Afrasian — it is attested in some Cushitic languages. In Burji, for example, it appears in the locative suffix -*ddi*, as in *miná-ddi* 'in the house'. In Berber, it appears as a preposition. Elamite has *da* (*tak*) 'also, too, as well, likewise; so, therefore, consequently, accordingly, hence; thereby, thereupon'. Particularly interesting is Altaic, where this particle functions as a locative suffix on the one hand, *-*da*, and as an independent particle on the other, **da* 'together with, and, also': Common Mongolian dative-locative suffix *-*da* > Mongolian -*da*; Dagur -*da*; Khalkha -*dɒ*; Buriat -*da*; Kalmyk -*dɒ* (cf. Poppe 1955:195—199). In Manchu, the dative-locative particle is -*de*. In Turkic, it also appears as a locative suffix: Common Turkic *-*da*/*-*dä* (cf. Menges 1968b:110). It may be preserved in Indo-European in the suffixed particle appearing, for example, in Sanskrit as -*ha* and -*dhi*: *sa-há* 'with' (Vedic *sa-dha*), *i-há* 'here' (Prakrit *i-dha*), *kú-ha* 'where?', *á-dhi* 'above, over, from, in'; in Avestan in *iδa* 'here', *kudā* 'where?'; and in Greek in the locative particle -θι in, for example, οἴκο-θι 'at home', πό-θι 'where?'.

Now let us look briefly at verb morphology. McAlpin (1981:122—123) notes that the Proto-Elamo-Dravidian verbal conjugation "does not survive in Dravidian as a paradigm". Therefore, we will give the verbal endings as they appear in Middle Elamite, using, once again, the verb *hutta-* 'to make' for illustration (cf. Reiner 1969:76; Grillot-Susini 1987:33):

Person	Singular	Plural
1	*hutta-h*	*hutta-hu* (< *-h+h*)
2	*hutta-t*	*hutta-ht* (< *-h+t*)
3	*hutta-š*	*hutta-hš* (< *-h+š*)

McAlpin derives the Elamite 1st sg. ending -*h* from Proto-Elamo-Dravidian *-*H*, the 2nd sg. ending -*t* from *-*ti*, and the 3rd sg. ending -*š* from *-*(V)š*. The Proto-Elamo-Dravidian 2nd sg. ending *-*ti* survives in South Dravidian negative imperatives.

The Sumerian finite verb employs various pronominal elements. These are described by Thomsen (1987:147, §287) as follows:

> The pronominal elements of the finite verbal form refer to the persons involved in the verbal action. There are two main series with different marks: the prefixes and the suffixes. A verbal form can have at most one prefix immediately before the verbal root and one suffix after the verbal root (or, if present, after /ed/), both referring to subject and/or object. The prefixes are identical with the pronominal elements which under some conditions occur together with case prefixes...

Thomsen (1987:148—149, §290) lists the following pronominal prefixes (see also Hayes 1997a:19 and 22—24):

1.sg.	*-?-*
2.sg.	*-e-*
3.sg. animate	*-n-*
inanimate	*-b-*
1.pl.	*-me-*
2.pl.	*-e ene-*
3.pl.	*-ene-*

The plural pronominal prefixes "are used as dative elements only..., and it is thus more probable that they are case elements rather than pronominal elements" (cf. Thomsen 1987:148).

The Sumerian pronominal prefixes are strongly reminiscent of the possessive suffixes/personal endings found in various Nostratic daughter languages — note, for example, the Proto-Uralic personal endings, which have been reconstructed as follows (cf. Hajdú 1972:40 and 43—45; Sinor 1988:725):

Person	Singular	Plural
1	**-me*	**-me* (+ Plural)
2	**-te*	**-te* (+ Plural)
3	**-se*	**-se* (+ Plural)

Even more interesting are the possessive suffixes reconstructed for Proto-Tungus (cf. Sinor 1988:725):

Person	Singular	Plural
1	**-m*	**-m* (+ Plural) (excl.)
2	**-t*	**-t*
3	**-n*	**-t*

Similar forms are found in Indo-European, Kartvelian, and Afrasian. The first person possessive suffixes/personal endings in **-m* found in various Nostratic daughter languages are similar in both form and function to the Sumerian first person pronominal prefixes, 1st singular *ma-* (< /mu-a-/) and 1st plural *-me-*, while the Proto-Tungus third person singular possessive suffix in **-n* (related forms are found in other Nostratic daughter languages) is similar to the Sumerian third person pronominal prefixes, 3rd singular *-n-*, *-na-* (< /-n-a-/) and 3rd plural *-ne-*, *-ene-*.

There are also two series of pronominal suffixes (cf. Thomsen 1987:152), the first of which (column A below) marks both the subject of intransitive verbs and the direct object of transitive verbs. It is also found after the enclitic copula. The second series (column B below), on the other hand, "serves as the subject marks of the two-

part. *marû* conjugation". In actual fact, only the 3rd persons singular and plural are different (cf. Thomsen 1987:152).

	A		B	
Person	Sg.	Pl.	Sg.	Pl.
1	*-en*	*-enden*	*-en*	*-enden*
2	*-en*	*-enzen*	*-en*	*-enzen*
3	*-Ø*	*-eš*	*-e*	*-ene*

There is simply nothing here that resembles what is found in Elamo-Dravidian nor, for that matter, at least for the first and second persons singular and plural, in other Nostratic languages. The third person pronominal suffixes, however, do have parallels in various Nostratic daughter languages. For a discussion of the etymology of the pronominal stems, see below.

The Sumerian personal pronoun stems are as follows (the Emesal forms are shown in parentheses; /g̃/ = /ŋ/) (cf. Thomsen 1987:68; Boisson 1992:437):

	1.sg.	2.sg.	3.sg.	3.pl.
Subject	*g̃á.e* *(me.e)* *g̃á-a-ra*	*za.e* *(ze)* *za-a-ra*	*e.ne* *e.ne-ra*	*e.ne.ne* *e.ne.ne-ra*
Dative	*g̃á-a-ar* *(ma-a-ra)*	*za-a-ar*		
Terminative	*g̃á(-a/e)-šè*	*za(-a/e)-šè*	*e.ne-šè*	*e.ne.ne-šè*
Comitative	*g̃á(-a/e)-da*	*za(-a/e)-da*	*e.ne-da*	*e.ne.ne-da*
Equative	*g̃á(-a/e)-gin*$_7$	*za(-a/e)-gin*$_7$	*e.ne-gin*$_7$	*e.ne.ne-gin*$_7$

The possessive suffixes are (cf. Thomsen 1987:71):

	Singular	Plural
1	*-g̃u*$_{10}$ 'my'	*-me* 'our'
2	*-zu* 'your'	*-zu.ne.ne*, *-zu.e.ne.ne*, *-zu.ne* 'your'
3 animate	*-a.ni* 'his, her'	*-a.ne.ne* 'their'
inanimate	*-bi* 'its'	*-bi* also 'their', presumably collective

Right away, we notice that the Emesal 1st singular forms (subject) *me.e*, (dative) *ma-a-ra* parallel the common Nostratic 1st person personal pronoun stem **mi* (~ **me*) 'I, me' (cf. Illič-Svityč 1971—1984.II:63—66, no. 299 **mi*; Bomhard—Kerns 1994:661—662, no. 540), while the 1st plural possessive suffix *-me* parallels the

common Nostratic inclusive 1st plural personal pronoun stem **ma-* (~ **mə-*) 'we, us' (cf. Bomhard—Kerns 1994:661—662, no. 540; Illič-Svityč 1971—1984.II: 52—56, no. 289 **mä*). The 2nd person personal pronoun *ze-*, *za-*, *-zu* may also correspond to the Proto-Nostratic 2nd person personal pronoun stem **t^hi-* (~ **t^he-*) 'you' (cf. Bomhard—Kerns 1994:285—287, no. 102; Dolgopolsky 1984:87—89 **t[ü]*), assuming affricatization of the dental before front vowel (similar to what has happened in Mongolian): **t^hi-* (~ **t^he-*) > **t^yi-* (~ **t^ye-*) > (**t^si-*/)**t^se- > *ze-* /t͡se-/, etc. (Sumerian <z> = /t͡s/ [cf. Boisson 1989:221—226 and 1992:436]). Finally, the 3rd person forms *e.ne* and *a.ne* are related to the demonstrative pronoun *ne.en*, *ne(-e)*, which has a parallel in the Proto-Nostratic demonstrative stem **na-* (~ **nə-*), **ni-* (~ **ne-*), **nu-* (~ **no-*) (cf. Bomhard—Kerns 1994:688—689, no. 570). To account for the beginning vowels in *e.ne* and *a.ne*, Shevoroshkin (cited in Boisson 1992:443) has suggested that these appear "to be a compound of the demonstrative / personal pronoun of the 3rd person **ʔi* / **ʔä* [...] plus the demonstrative base **n(ä)*". I agree with Shevoroshkin's suggestion. Though widespread in the Nostratic daughter languages, these stems are lacking in Dravidian (though see Dolgopolsky 1984 for a slightly different interpretation of the Dravidian material). Zvelebil (1977:40) reconstructs the following personal pronoun stems for Proto-Dravidian (see also Krishnamurti 2003:244—253):

	Singular	Plural
1	**yān* : **yan-* 'I'	(incl.) **yām* : **yam-* 'we' (excl.) **nām* : **nam-* 'we'
2	**nīn* : **nin-* 'you'	**nīm* : **nim-* 'you'
3	**tān* : **tan-* 'he, she, it'	**tām* : **tam-* 'they'

McAlpin (1981:112) begins his discussion of pronouns by making some very important observations regarding the relationship of the Elamite and Dravidian pronouns:

> 530.0 The personal pronouns have long been an enigma in the relationship of Elamite to Dravidian. On the one hand, the second person pronouns provided the morphological detail first recognized as being cognate... On the other hand, one of them, the first person plural is still somewhat ambiguous as to its form in PED. For the others, it has been a long quest, fitting together the morphological pieces. The major breakthrough came with the realization that the Proto-Dravidian pronouns were not ultimately archaic, but rather a major innovation in late Pre-Dravidian. The nature of the innovation was the replacement of the nominative by oblique stems. Thus, Proto-Dravidian pronouns have little to say directly about the morphology of nominative bases in PED. However, the same forms, in a different usage, were preserved as personal possessive prefixes in kinship terminology. This was maintained as a system for a few kin terms in Old Tamil and sporadically in many other Dravidian languages. Thus, Dravidian does attest the PED system, but not directly in the paradigm.

McAlpin (1981:112—117) reconstructs the following personal pronoun stems for Proto-Elamo-Dravidian:

	Singular	Plural
1	**i*	**nəNKə*
2	**ni*	**nim*
3 resumptive	**ta(n)*	
reflexive	**i*	

The 1st person singular is to be derived from Proto-Nostratic **ʔiya* 1st person personal pronoun stem (postnominal possessive/preverbal agentive) found also in Afrasian (cf. Bomhard—Kerns 1994:597—598, no. 470; Dolgopolsky 1984:72, 83, 85—86, 96, and 99—100), while the 3rd person stem **ta(n)* is to be derived from the widespread Nostratic demonstrative stem **t^ha-* (~ **t^hə-*) 'this' (cf. Bomhard—Kerns 1994:287—289, no. 103), and the Proto-Dravidian 1st plural (exclusive) stem **nām* : **nam-* 'we' is to be derived from the Proto-Nostratic 1st person personal pronoun stem **na-* (~ **nə-*) (cf. Bomhard—Kerns 1994:683—684, no. 564; Dolgopolsky 1984:90—91) — this stem may have a parallel in the Sumerian 1st person pronoun *g̃á-* /ŋa-/, but this is uncertain.

Also worth noting are the Sumerian interrogative particles *me-na-àm* 'when?', *me-a* 'where?', and *me-šè* 'to where?', which parallel the Nostratic interrogative stem **mi-* (~ **me-*), found in Indo-European (marginally only — relic forms are found in Celtic, Tocharian, and Hittite), Kartvelian, Afrasian, Uralic, and Altaic (for details, cf. Bomhard—Kerns 1994:645—647, no. 524).

15.5. CONCLUSIONS

The evidence surveyed in this chapter indicates that Sumerian does not bear a special relationship to Elamo-Dravidian. Moreover, Sumerian does not bear a special relationship to any other Nostratic daughter language either. Rather, the evidence seems to indicate that Sumerian is not a Nostratic daughter language at all but that it is distantly related to Nostratic. However, there are also many problems that must still be solved regarding the exact nature of that relationship — we have only scratched the surface in this brief summary.

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References: Boisson 1987a, 1987b, 1988a, 1988b, 1988d, 1989a, 1989b, 1992, 2002a, and 2002b; Clauson 1973b; Crawford 1991; Edzard 2003; Fähnrich 1981; Falkenstein 1959; Fane 1990; Hayes 1997a and 1997b; Jagersma 2010; Michalowski 1980, 1992, and 2004; Rubio 1999, 2007a, and 2007b; Sathasivam 1965; Thomsen 1987; Zakar 1971; Zólyomi 2010.

PART TWO

COMPARATIVE MORPHOLOGY

CHAPTER SIXTEEN

NOSTRATIC MORPHOLOGY I: THE EVIDENCE

16.1. INTRODUCTION

One of the criticisms often leveled at the Nostratic Hypothesis is the relative dearth of morphological evidence presented by its proponents. Recently, this deficiency has begun to be filled. The late Joseph H. Greenberg has amassed a tremendous amount of morphological evidence in volume 1 of his book *Indo-European and Its Closest Relatives*. On the basis of the morphological evidence alone, I believe that Greenberg has successfully demonstrated that Eurasiatic is a valid linguistic taxon of and by itself. Though not without problems (cf. Georg—Vovin 2003), the morphological evidence that Greenberg has gathered for determining which languages may be related to Indo-European is the most complete to date and the most persuasive — it goes far beyond what Illič-Svityč was able to come up with, and it also surpasses what was presented in the chapter on morphology by John C. Kerns in our joint monograph *The Nostratic Macrofamily*.

I have tried to demonstrate in this and other works that Greenberg's Eurasiatic is a branch of Nostratic. If, as I have claimed, that is in fact the case, then there should be clear morphological parallels between Eurasiatic and the other branches of Nostratic, and indeed there are. This will be demonstrated here.

In this chapter, I shall present the morphological evidence for Nostratic, incorporating (and amending, as necessary) what Greenberg gathered for Eurasiatic with data from the non-Eurasiatic branches of Nostratic, making use especially of the works of Illič-Svityč and Dolgopolsky (Fortescue 1998, Kortlandt 2010, and Nafiqoff 2003 have also been helpful). I shall also include evidence not found in Greenberg's book nor in the works of Illič-Svityč and Dolgopolsky, while, at the same time, excluding dubious or poorly supported proposals made in these works. However, I shall not attempt a systematic reconstruction of Nostratic morphology here, but, rather, I shall merely present the evidence — a systematic reconstruction of Nostratic morphology will be attempted in the following chapter. Explanations are provided where appropriate, and references are given to relevant literature.

16.2. GENERAL COMMENT

In volume 1 of his book *Indo-European and Its Closest Relatives*, Greenberg did not reconstruct the vowels for the Eurasiatic pronoun stems he identified. However, this shortcoming can be easily remedied since the evidence from the daughter languages (both Eurasiatic and non-Eurasiatic) is fairly straightforward here. Thus: §1. First-Person M: first person independent pronoun (active) **mi*. §2. First-Person

K: first person independent pronoun stem (stative) *k^ha. §3. First-Person N: first person independent pronoun stem **na*. §4. Second-Person T: second person independent pronoun stem *t^hi. §5. Second-Person S: second person independent pronoun stem **si*. For §6, Second-Person N, on the other hand, the evidence in Eurasiatic makes it difficult to reconstruct the vowel — indeed, as Greenberg notes, the very existence of a second person pronoun **N* in Proto-Eurasiatic is questionable. Bringing in other Nostratic languages, however, allows us to reconstruct **ni*.

I. PRONOMINAL, ANAPHORIC, AND DEICTIC STEMS

16.3. First person singular **mi* (~ **me*), first person plural (inclusive) **ma* (~ **mə*) (Greenberg: §1. First Person M; Illič-Svityč 1971—1984.II:52—56, no. 289, **mä* 1st person pl. inclusive personal pronoun, II:63—66, no. 299, **mi* 1st person sg. personal pronoun; Dolgopolsky 1984:85 **mi* 'I, me, my' and 2008, no. 1354, **mi* 'I', no. 1354a, **mi ʔa* 'we'; Nafiqoff 2003:40—41, 46 **mä* [1st pl. inclusive], **mi* [1st sg.], and 58—62; Fortescue 1998:96—123)

There actually appear to be two separate stems involved here: (a) **mi* (~ **me*) first singular personal pronoun 'I, me' and (b) **ma* (~ **mə*) first plural personal pronoun (inclusive) 'we, us'.

In Afrasian and Dravidian, first person singular **mi* and first person plural (inclusive) **ma* have been mostly lost. For an excellent overview of the personal pronouns in Afrasian, cf. Diakonoff 1988:70—79; for Elamo-Dravidian, cf. McAlpin 1981:112—117; and for Dravidian, cf. Krishnamurti 2003:244—253, Steever 1998a:21—23, and Zvelebil 1977:40—52.

A. Afrasian: This stem appears only in Chadic as an independent pronoun: cf. Hausa (pl.) *maa* 'we', (indirect object pl.) *manà* 'us, to us, for us', (pl.) *muu* 'we, us, our', (past tense subj. pl.) *mun* 'we', (continuous tense subj. pl.) *munàa* 'we', (indirect object sg.) *minì* 'me, to me, for me'; Kotoko *mi* 'we, us'; Mandara *ma* 'we, us'; Musgu (sg.) *mu* 'I, me', (pl.) *mi* 'we, us'; Bole *mu* 'we, us'. It also serves as the basis of the first singular verbal suffix in part of Highland East Cushitic: cf. the perfect endings in Hadiyya: *-ummo*, Kambata: *-oommi*, and Sidamo: *-ummo*. In Burji and Gedeo / Darasa, on the other hand, the perfect suffixes are *-anni* and *-enne* respectively, which are based upon the first person stem **na* discussed below.
B. Dravidian: First plural suffix **-m* in: (a) first person plural exclusive **yā-m-* (obl. **yă-m-*), (b) first person plural inclusive **ñā-m-* (obl. **ñă-m(m)-*) > (a) Tamil *yām* 'we'; Kota *a·m* 'we'; Kannaḍa *ām* 'we'; Telugu *ēmu* 'we'; Kolami *a·m* 'we'; Naikṛi *ām* 'we'; Parji *ām* 'we'; Gadba (Ollari) *ām* 'we'; Manḍa *ām* 'we'; Kuṛux *ēm* 'we'; Malto *ém* 'we'; etc. (cf. Burrow—Emeneau 1984:467—468, no. 5154); (b) Tamil *nām* 'we' (inclusive); Malayalam *nām* 'we'

(inclusive); Kuṛux *nām* ‘we’ (inclusive); Malto *nám* ‘we’ (inclusive); etc. (cf. Burrow—Emeneau 1984:322, no. 3647). It also occurs as the first plural suffix in finite verbs: *-*V̌m* > Tamil *-mu*, *-mi* first plural exclusive suffix, *-amu* first plural inclusive suffix; Kui *-amu*, *-ami* first plural exclusive suffix; Kuwi *-amu*, *-omi* first plural exclusive suffix; Kuṛux *-m* first plural exclusive suffix; Malto *-im*, *-em*, *-om* first plural exclusive suffix; Parji *-am*, *-um*, *-om*, *-m* first plural exclusive suffix; Kolami *-um*, *-am*, *-m* first plural exclusive suffix, *-am* first plural inclusive suffix; etc. Cf. Krishnamurti 2003:246—248 and 308—312. Finally, it is found in the alternative forms of the first plural exclusive pronoun in: Gondi (dialectal) (nom. pl.) *mamm-ăṭ*, *mā-ṭ*, *mām-aṭ*, *mamm-oṭ*, *mamo-o*, *mar-at*, *mamm-a*, *mā-m* ‘we’, (obl. pl.) *mā-* ‘us’; Telugu (nom. pl.) *mēmu* ‘we’, (obl. pl.) *mamm-*, *mā-* ‘us’; Konḍa (nom. pl.) *māp* ‘we’, (obl. pl.) *mā-* ‘us’; Kui (nom. pl.) *māmu* ‘we’, (obl. pl.) *mā-* ‘us’; Kuwi (nom. pl.) *māmu* ‘we’, (obl. pl.) *mā-* ‘us’; Pengo (obl. pl.) *maŋg-*, *mā-* ‘us’. Cf. Krishnamurti 2003:247.

C. Kartvelian: Proto-Kartvelian **me-*, **men-* first person personal pronoun stem > Georgian *me-*, *men-*, *mena-* ‘I’; Mingrelian *ma-* ‘I’; Zan *ma*, *man* ‘I’; Svan *mi-* ‘I’. It occurs in Georgian *m-* first person singular verb prefix (objective conjugation) and is also found in Svan as the first person personal formant (objective) *m-* (cf. Tuite 1997:23). Cf. Klimov 1964:132 **me(n)* and 1998:119 **men* ‘I’; Schmidt 1962:123 **me* ‘I’; Fähnrich—Sardshweladse 1995:223—224 **m-* first person verb prefix (objective conjugation), and 233—234 **me-* ‘I’; Fähnrich 1994:240, 260, and 2007:273 **m-* first person verb prefix (objective conjugation), and 284 **me-* ‘I’.

D. Indo-European: Proto-Indo-European **me-* used to form the oblique cases of the first person personal pronoun stem: Sanskrit (acc. sg.) *mā́m*, *mā*, (gen. sg.) *máma*, *me*, (abl. sg.) *mát*, (dat. sg.) *máhya(m)*, (loc. sg.) *máyi*, (inst. sg.) *máyā*; Greek (acc. sg.) ἐμέ (με), (gen. sg.) ἐμεῖο (μευ), (dat. sg.) ἐμοί (μοι); Old Latin (acc.-abl. sg.) *mēd*, (gen. sg.) *meī*, *mīs*, (dat. sg.) *mihī*; Gothic (acc. sg.) *mik*, (gen. sg.) *meina*, (dat. sg.) *mis*; etc. Proto-Indo-European (a) **-mi* first person singular non-thematic primary ending, (b) **-m* first person singular non-thematic secondary ending: Sanskrit (1st sg. primary) *-mi*, (1st sg. secondary) *-m*; Hittite (1st sg. primary) *-mi*, (1st sg. secondary) *-n* (< **-m*); Greek (1st sg. primary) -μι, (1st sg. secondary) -ν (< **-m*); Old Latin (1st sg. primary and secondary) *-m*; etc. Proto-Indo-European **-me-* combined with the plural markers **-s-* and **-n-* to indicate the first person plural in verbs (cf. Meillet 1964:229—230): (primary) **-mesi*, **-meni*, (secondary) **-mes*, **-men*: Sanskrit (1st pl. primary) *-mas(i)*, (1st pl. secondary) *-ma*; Hittite (only after *-u-*) (1st pl. primary) *-meni*, (1st pl. secondary) *-men*; Greek (1st pl. primary and secondary) -μεν/-μες; Old Latin (1st pl. primary and secondary) *-mus*; etc. According to Greenberg (2000:77—78), in Proto-Indo-European, this **-m* was added to the nominative singular of the first person independent pronoun: **ʔe-gʰŏ-m*, **ʔe-k’ŏ-m* ‘I’: Sanskrit *ahám* ‘I’; Greek ἐγώ(ν) ‘I’; etc. For details, cf. Beekes 1995:207—209, 232—235; Brugmann 1904:407—413, 588—596; Fortson 2010:141—142; Gamkrelidze—Ivanov 1995.I:254—260; Szemerényi 1996:211—218, 233—235, 327—33; Meillet 1964:227—235 and 332—338.

E. Uralic-Yukaghir: Proto-Uralic **mV* first person independent personal pronoun stem — (a) first person singular: Finnish *minä*/*minu-* ‘I’; Lapp / Saami *mon*/*mú-* ‘I’; Mordvin *mon* ‘I’; Cheremis / Mari *mĭń*, *mõj(õ)* ‘I’; Votyak / Udmurt *mon* ‘I’; Zyrian / Komi *me* (acc. *menõ*) ‘I’; Ostyak / Xanty *mä*, *mən-* ‘I’; Yurak Samoyed / Nenets *mań* ‘I’; Tavgi Samoyed / Nganasan *mannaŋ* ‘I’; Yenisei Samoyed / Enets *mod'i* ‘I’; Selkup Samoyed *man*, *mat* ‘I’; Kamassian *man* ‘I’; (b) first person plural: Finnish *me* ‘we’; Lapp / Saami *mí* ‘we’; Mordvin *min* ‘we’; Cheremis / Mari *mä*, *me* ‘we’; Votyak / Udmurt *mi* ‘we’; Zyrian / Komi *mi* ‘we’; Vogul / Mansi *man* ‘we’; Ostyak / Xanty *mŏŋ* ‘we’; Hungarian *mi* ‘we’; Yurak Samoyed / Nenets *mańaˀ* ‘we’; Tavgi Samoyed / Nganasan *meeŋ* ‘we’; Yenisei Samoyed / Enets *mod'iˀ* ‘we’; Selkup Samoyed *mee*, *mii* ‘we’; Kamassian *miˀ* ‘we’. Proto-Uralic first person personal/possessive suffix **-m(V)*: Finnish *pala-m* ‘I burn’; Lapp / Saami *buola-m* ‘I burn’; Mordvin *vana-n* ‘I see’; Cheremis / Mari *wide-m* ‘I lead’; Vogul / Mansi *totegu-m* ‘I bring’; Ostyak / Xanty *tetə-m* ‘I eat’; Hungarian *esze-m* ‘I eat’; Yurak Samoyed / Nenets *mada-m* ‘I cut’; Tavgi Samoyed / Nganasan *mataˀa-m* ‘I cut’; Kamassian *nereel'ɛ-m* ‘I become afraid’. Cf. Collinder 1960:308—310, 1965:134—135, 141 Common Uralic **minä* ~ **myna* ‘I’, and 1977:53, 54; Abondolo 1998a:24—25; Rédei 1986—1988:294 **mŭ* ‘I’ and 294—295 **mŭ* ‘we’; Décsy 1990:103 **me* ‘I’ and **me* ‘we’. The first person independent pronouns in Yukaghir (Northern / Tundra) are: (sg.) *met* ‘I’, (pl.) *mit* ‘we’ (cf. Nikolaeva 2006:267 and 269—270). In Yukaghir, a suffix *-m* is found as a first person singular subject of the verb in its interrogative form.

F. Altaic: Proto-Altaic **bĭ* first person singular independent pronoun (if from **mi*) ‘I’ > (a) Proto-Tungus **bi* ‘I’ > Manchu *bi* ‘I’; Evenki *bi* ‘I’; Lamut / Even *bi* ‘I’; Negidal *bi* ‘I’; Ulch *bi* ‘I’; Orok *bi* ‘I’; Nanay / Gold *mi* (dialectal *bi*) ‘I’; Oroch *bi* ‘I’; Udihe *bi* ‘I’; Solon *bi* ‘I’; (b) Proto-Mongolian **bi* ‘I’ > Written Mongolian *bi* ‘I’ (gen. *minu*); Dagur *bī* ‘I’ (gen. *minī*); Monguor *bu* ‘I’ (gen. *muni*); Ordos *bi* ‘I’ (gen. *mini*); Khalkha *bi* ‘I’ (gen. *miniy*); Buriat *bi* ‘I’ (gen. *menī*); Kalmyk *bi* ‘I’ (gen. *minē*); Moghol *bi* ‘I’ (gen. *mini*); (c) Proto-Turkic **bẹ-* ‘I’ > Old Turkic *ben* ~ *men* ‘I’; Karakhanide Turkic *men* ‘I’; Turkish *ben* ‘I’; Gagauz *ben* ‘I’; Azerbaijani *män* ‘I’; Turkmenian *men* ‘I’; Tatar *min* ‘I’; Bashkir *min* ‘I’; Karaim *men* ‘I’; Kazakh *min* ‘I’; Kirghiz *men* ‘I’; Noghay *men* ‘I’; Uzbek *men* ‘I’; Uighur *män* ‘I’; Yakut *min* ‘I’; Chuvash *e-bə* ‘I’. Cf. Starostin—Dybo—Mudrak 2003:341—342 **bĭ* ‘I’. Starostin—Dybo—Mudrak (2003:342) note: “An alternation **bi* / **mi-ne-* (sing.); **ba* / **mi̯u-n-* (plur.) should be reconstructed”. In Turkic, **-m* occurs as the first person singular personal marker of the subject in the verb and as possessive in the noun (cf. Dolgopolsky 1984:77). Similar suffixes are found in the Tungus languages — first person possessive suffixes: (sg.) **-m*, (pl.) **-m* plus plural marker (exclusive), with variation between *m-*, *b-*, and *w-* in the individual daughter languages (cf. Sinor 1988:726).

G. Chukchi-Kamchatkan: Proto-Chukchi-Kamchatkan **mur(i)* ‘we’ > Chukchi *mu-ri* ‘we’, *muryn* ‘our’; Kerek (pl.) *məjəkku* ‘we’, (dual) *məəj* ‘we two’; Koryak (dual) *muji* ‘we two’, (pl.) *muju* ‘we’, *mucyn* ‘our’; Alyutor (pl.)

muruwwi ‘we’, (dual) *muriɣ-* ‘we two’; Kamchadal / Itelmen *muzaʔn* ‘we’, *mizvin* ‘our’. Cf. Fortescue 2005:179. Proto-Chukchi-Kamchatkan suffix **-m* in the first person singular independent personal pronoun **kə-m* ‘I’ > Chukchi *ɣəm* ‘I’ (in predication: *-iɣəm* ~ *-eɣəm*); Kerek *umŋu* ‘I’; Koryak *ɣəmmo* ‘I’; Alyutor *ɣəmmə* ‘I’; Kamchadal / Itelmen *kəm(m)a* ‘I’; *kəm(m)an* ‘my’. Cf. Fortescue 2005:146—147; Bogoras 1922:719.

H. Gilyak / Nivkh: Gilyak (Amur) first person pronoun: (dual) *mę-gi*, (pl.) *me-r* (inclusive) (cf. Gruzdeva 1998:25—26).

I. Eskimo-Aleut: Eskimo: perhaps preserved in Sirenik *məŋa* ‘I’. In Aleut, **-m(V)* is found in the affixed first person plural forms: (Central) *-mas*, (Eastern and Western) *-man*.

J. Etruscan: Etruscan *mi* ‘I’, *mini* ‘me’ (cf. Bonfante—Bonfante 2002:91); Raetic *mi* ‘I’ (cf. Sverdrup 2002:108).

Sumerian: (Emesal) *ma(-e)*, *me-a*, *me-e* ‘I’. According to earlier theories, the first person plural pronominal suffix was *-me-*. But Thomsen (1987:148) points out that *-me-* is used as a dative element only, in the meaning ‘for us’. She considers *-me-* to be a case element rather than a pronominal element. However, both its form and meaning indicate that *-me-* should be included here. The first first person singular possessive suffix was *-mu* ‘my’.

16.4. First person **kʰa* (~ **kʰə*) (Greenberg: §2. First-Person K; Dolgopolsky 1984:69—71)

A. Afrasian: Diakonoff (1988:72—73) lists independent personal pronouns of the direct case in a table. For Proto-Semitic, he reconstructs first person singular **ʔan-āku*, **ʔan-ā*, and **ʔan-ī*, that is, a stem **ʔan-* followed by three suffixal elements, the first of which, **-āku*, appears to contain a double suffix, that is, the **-ā* found in the second form further extended by **-ku* (cf. Moscati 1964:103—104, where the Proto-Semitic form is reconstructed as **ʔanā[ku]*). According to Barth (1913:4), **ʔanāku*, *-ki* is composed of **ʔana* plus the demonstrative stem **ku*, **kī*. Dolgopolsky (1984:70), on the other hand, does not analyze **-āku* as a compound suffix. In the same article, it may be noted, Dolgopolsky reconstructs a Proto-Nostratic **HVkE*, which he describes as either a “non-pronominal word liable to replace the independent pronoun” or as a “nomen regens following an appositional nomen”. **-ku* is also a widespread marker of the first person singular in the stative (cf. the table in Diakonoff 1988:92—93). This **-ku* also appears in the Egyptian first person singular pronoun *i̯n*-k and the Tashelhiyt (Berber) first person singular pronoun *n*k*i* in the table given by Diakonoff. Forms in other Berber languages include: Tuareg *nək*, *nəkkunan* ‘I, me’; Ghadames (Ghadamsi) *nəc*, *nəccan* ‘me’; Mzab *nəcc*, *nəcci*, *nəccin* ‘me’; Tamazight *nəkk* ‘me’; Kabyle *nəkk*, *nəkki*, *nəkkini* ‘I, me’. It is this **-ku* that I would compare with the forms under discussion here. Note also Ongota *ka*/*-k* ‘I, me’ (cf. Fleming 2002b:50).

B. Elamo-Dravidian: David McAlpin (1981:119—120, §542.1) reconstructs a first person singular appellative personal ending *-*kə* for Proto-Elamo-Dravidian, and this undoubtedly belongs with the forms under consideration here. Note the first person personal possessive pronominal enclitic in Brahui: -*ka*. Note also the locutive -*k* in Elamite in, for example, *u...sunki*-k 'I am king' or *huttah halen*-k 'I made it at great pains' (*hutta-h*, predicate; *halen*-k, included form, locutive).

For Proto-Dravidian, Zvelebil (1990:35—36) reconstructs a first person singular non-past personal ending *-*N-ku*, found, for example, in Old Tamil (archaic non-past) -*Ø-ku* and in Gondi (future) -*k-ā*, while the first person plural exclusive non-past personal ending was *-*N-kum*, found, for example, in Old Tamil (archaic non-past) first person plural exclusive -*Ø-kum* and in Gondi (future) first person plural exclusive -*k-em*, first person plural inclusive -*k-āṭ*. Cf. also Krishnamurti 2003:290 and 301—304.

C. Indo-European: I have difficulty in accepting Greenberg's basis for writing the Hittite (and Luwian) laryngeal as *x*. I prefer the traditional transcription *ḫ*, which, of course, says nothing about the phonetics. Greenberg should have given a little explanation here and mentioned that some scholars (Sturtevant and Lehmann, for example) have interpreted *$\underline{h}_2$ as a voiceless velar fricative /x/.

I agree with Greenberg's statement that "The perfect is originally stative and cannot take an object", but not with his comparison of the Hittite-Luwian endings and earlier Indo-European first person perfect ending *-*Ha* with the *k*-forms from the other Eurasiatic languages. Rather, I would prefer comparison with the heretofore unexplained first person perfect endings in *-*k*- found, for example, in Tocharian A (preterite active) *tākā*- 'I was', Latin *fēcī* 'I made', Greek ἔθηκα 'I placed', etc. Elsewhere (Bomhard 1996a:94), I have compared the Proto-Indo-European first person perfect ending *-*Ha* with the Elamite first person ending -*h* (note that David McAlpin 1981:122, §552.0, derives the Elamite first person forms in -*h* from Proto-Elamo-Dravidian **H* — see below). Let's look at this in a little more detail:

The perfect reconstructed by the Neogrammarians for Proto-Indo-European was distinguished from the present and aorist by a unique set of personal endings in the indicative, namely, first person singular *-*Aa* (traditional *-$\underline{h}_2e$; cf. Sanskrit *véd-a* 'I know', Greek οἶδ-α, Gothic *wait*), second person singular *-*t^hAa* (traditional *-*t$\underline{h}_2e$*; cf. Greek οἶσ-θα, Sanskrit *vét-tha* 'you know', and Gothic *waist*), third person singular *-*e* (cf. Sanskrit *véd-a* 'he/she knows', Greek οἶδ-ε, and Gothic *wait*). Except for Armenian and Balto-Slavic, the perfect remained in all branches. It was least changed in Indo-Iranian, Celtic, and Germanic. In Greek, however, it was mixed up with a κ-formation and, in Italic, with a whole series of non-perfect tense forms. According to Greenberg, the perfect was originally stative, and Karl Horst Schmidt, Norbert Oettinger, Winfred P. Lehmann, Thomas Gamkrelidze and Vjačeslav Ivanov, Andrew Sihler, and others have made similar claims. Sihler (1995:564—590) gives an excellent overview of the stative in Indo-European.

Now, Greek has a unique formation, the so-called "first perfect", which would be better named the "κ-perfect". As noted by Sihler (1995:576): "Its inception must belong to prehistoric G[reek], for it is already established, within limits, in Hom[er] and in the earliest records of other dialects." Moreover, Sihler notes (1995:576): "In Hom[er] the formation is found in some 20 roots, all ending in long vowel (from the G[reek] standpoint), and in all of them the κ-stem is virtually limited to the SINGULAR stems which actually contain a long vowel… Later the formation, by now more accurately a κα-perfect, spreads to other stems ending in a long vowel, then to stems ending in any vowel (including denominatives), and finally to stems ending in consonants, and to all persons and numbers." This is very important, for Sihler here traces the expansion of this stem type within the history of Greek itself. Thus, we are dealing with developments specific to Greek. Buck (1933:289—290) agrees with Sihler here.

In Latin, we find first singular perfect forms *fēcī* 'I did' and *iēcī* 'I threw' (N.B. *faciō* and *iaciō* are "secondary elaborations based on these" [Sihler 1995:562]). As in Greek, the *-c-* [k] is found in all persons (cf. third singular *fecit*), and, as in Greek, the *-c-* [k] has given rise to secondary formations.

The *-k-* forms are also found in Tocharian, as in first singular preterite active *tākā-* (< **(s)tā-k-ā-* < **(s)teA-* [**(s)taA-*] 'to stand' [cf. Adams 1999: 345—356]) 'I was', and, as in Greek and Latin, the *-k-* is found in all persons and has given rise to secondary formations. Van Windekens (1976.I:495—496) goes so far as to posit Proto-Indo-European **dhēq-*, **dhə$_1$q-*, as does Rix (1998a:120—121 and 2001:139—140 **d^{h}eh$_1$k-*).

On the basis of the evidence from Greek, Latin, and Tocharian, we may assume that a "suffix" **-k-* is to be reconstructed for late-stage Proto-Indo-European — what I have often referred to as "Disintegrating Indo-European". This "suffix" originally had a very limited distribution — it seems to have appeared only in the perfect (< stative) singular of verbs that ended in a long vowel, when the long vowel originated from earlier short vowel plus laryngeal. All of the other formations found in Greek, Italic, and Tocharian are secondary elaborations. But, we can go back even farther — it is my contention that the *-k-* originally characterized the first person exclusively, from which it spread to other persons. Of course, this suggestion is not new. Sturtevant (1942:87—88) suggested that **-k-* developed in the first person singular when a root-final laryngeal was followed by the ending **-xe* (that is, **-H$_2$e* [Kuryłowicz would write **-ə$_2$e*]). Though a laryngeal explanation along these lines has not been generally accepted, the suggestion that the *-k-* was originally confined to the first person singular is still worthy of consideration, especially in view of the extensive evidence from other Nostratic languages.

D. Uralic: Proto-Uralic alternative first person marker (subjective conjugation) **-k*. Greenberg (2000:67—68) presents evidence from Hungarian and Selkup for this ending. See also Collinder 1960:309: "Selkup has *-k* (*ŋ*). Hungarian has, in all the form groups except in the *ik*-verbs and in the *t*-preterite of the verbs without *-ik*, the ending *-k*." (Note: the ending *-k* occurs here as well.)

E. Chukchi-Kamchatkan: Greenberg (2000:68) notes that Bogoras "reconstructs a set of suffixes for the intransitive verb with *-k-* as first-person singular and zero as third-person singular". Specifically, Bogoras (1922:736) writes: "The pronominal suffixes do not show a close relation to the personal pronoun, and, furthermore, are somewhat differentiated in different modes of the verb. A comparison of the various forms suggests the following as the essential elements of the suffixed pronominal verbal forms:

INTRANSITIVE

I ……..	*-k*	we	*-mk*
thou …	?	ye	*-tk*
he ……	—	they	*-t*

"It may be that the *m* and *t* of the first and second persons plural are related to *mu̯ri̯* and *tu̯ri̯*, …"

F. Eskimo-Aleut: Greenberg (2000:68—69) discusses the contrast between an ergative *-m* and an absolutive *-k* as first person singular in Eskimo. He notes specifically that the first person singular possessive suffix *-ma* is attached to nouns that are the subject of transitive verbs, while *-ka* (> *-ŋa*) is attached to nouns that are the object of transitive verbs or the subject of intransitive verbs.

G. Etruscan: First person singular passive preterite ending *-χe*, as in: *mi araθiale ziχuχe* 'I was written for Araθ', *mi titasi cver menaχe* 'I was offered as a gift to Tita' or 'I was offered as a gift by Tita' (cf. Bonfante—Bonfante 2002:101). This ending is also found in Raetic: *tina-χe* 'I have given, I gave' (cf. Sverdrup 2002:98).

16.5. First person **ħa* (~ **ħə*) (not in Greenberg 2000; Dolgopolsky 1984:85—86 derives the forms discussed below — along with several others — from Proto-Nostratic **HoyV* 'by me' [agent])

A. Elamite: Middle Elamite first person singular I conjugation (transitive, past tense) subject ending *-h* (pl. *-hu* [< **-h-hu*]). This conjugation was formed by adding the personal subject endings to the verb stem. The object was not reflected in the verbal form. Cf. Khačikjan 1998:34; Grillot-Susini 1987:33; Reiner 1969:76. McAlpin (1981:122, §552.0) notes that this ending does not seem to have any cognates in Dravidian.

B. Kartvelian: This form may be preserved in the second person prefix (subjective) **x-*, the third person prefix (objective) **x-*, and the first person prefix (subjective) **xw-* (< **x-w-*). Cf. Fähnrich—Sardshweladse 1995:543, 544, 547—548; Fähnrich 1994:241 and 2007:680. If these forms are indeed related to those under discussion in this section, the spread of what was originally a first person affix to other persons must have been a development specific to Kartvelian since nothing comparable is found elsewhere (except

perhaps in the case of the second sg. perfect ending in Indo-European, where the ending of the first singular appears to have been added to *-t^h: *-t^h+*Aa*).

C. Indo-European: Proto-Indo-European first singular perfect (< stative) ending *-*ḫ͡ḫe* [*-*ḫ͡ḫa*] (Cf. Lehmann 2002:171 *-*χ-e*; Fortson 2010:103 *-h_2e; Beekes 1995:238 *-h_2e; Meillet 1964:231 *-*a*; Gamkrelidze—Ivanov 1995.I:256—260 *-*Ha*; Brugmann 1904:590 *-*a*; Szemerényi 1996:243—244 *-*a*; Burrow 1973:317 *-*Ha*; Dolgopolsky 1984:58 *-*He*): Sanskrit *véd-a* 'I know'; Greek οἶδ-α. In Indo-European, this ending has mostly replaced first person *k^ha, which is preserved only in secondary formations in several daughter languages (see above for details).

16.6. First person singular **na* (~ **nə*) (Greenberg: §3. First-Person N; Dolgopolsky 1984:90 reconstructs Proto-Nostratic **nV* 'we' [exclusive])

On the basis of Dravidian (and possibly Altaic), the original form of this stem may have been **ŋa* (~ **ŋə*), but this is not certain. Sumerian (Emegir) *g̃á.e* (= /ŋa-/) 'I' supports such a reconstruction as well.

A. Afrasian: There is evidence for a first person singular **nV* in Afrasian: Chadic independent pronoun: Hausa *ni* 'I, me'; Ngizim *na(a)* 'I'; Mubi *ni* 'I'; Semitic first person verb suffix: Akkadian *-ni*, Ugaritic *-n*, Hebrew *-nī*, Syriac *-n*, Arabic *-nī*, Geez *-nī*, etc. (cf. Moscati 1964:106, §13.14). Ongota *naa-ku*/*na* 'for me, to me', *s-ine* 'my' (cf. Fleming 2002b:50).

Ehret (1995:362 and 363) reconstructs the following first person pronouns for Proto-Afrasian: **ʔan-*/**ʔin-* or **an-*/**in-* 'I'; **ʔann-*/ **ʔinn-* or **ann-*/**inn-* 'we' (= **ʔan-*/**ʔin-* or **an-*/**in-* + old Afrasian pl. in **-n*). Militarëv (2011:77), however, analyzes this stem as a compound **ʔa-na(-k/tV)-*, that is, **ʔa+na-*: Semitic: Arabic *ʔanā* 'I', Sabaean *ʔn* 'I', Hebrew *ʔănī*, *ʔānōχī* 'I', Syriac *ʔenā* 'I', Eblaite *ʔanna* 'I', Old Babylonian *anāku* 'I', Ugaritic *ản*, *ảnk* 'I', Geez / Ethiopic *ʔana* 'I', Tigrinya *ʔanä* 'I', Tigre *ʔana* 'I', Amharic *əne* 'I' (cf. Moscati 1964:102, §13.1; Lipiński 1997:298—299); Egyptian *i̯nk* 'I', Coptic *anok* [ⲁⲛⲟⲕ] 'I'; Berber: Tuareg *nək* 'I, me', Kabyle *nəkk* 'me', Tamazight *nəkk* 'me'; East Cushitic: Burji *áni* 'I', Gedeo / Darasa *ani* 'I', Hadiyya *ani* 'I', Kambata *ani* 'I', Sidamo *ane*, *ani* 'I', Saho-Afar *an-u* 'I', Bayso *an-i*, *an-a*, *an-ni* 'I', Rendille *an(i)* 'I', Galla / Oromo *an(i)* 'I', Dullay *an-o* 'I'; Southern Cushitic: Iraqw *an*, *ani* 'I', Burunge *an*, *ana* 'I', Alagwa *an*, *ana* 'I', Ma'a *áni* 'I', Dahalo *ʔányi* 'I'. Cf. Hudson 1989:83; Sasse 1982:26; Ehret 1980:283. Beja / Beḍawye *ʔane* 'I' (cf. Appleyard 2007a:457; Reinisch 1895:20).

B. Dravidian: First person singular stem **ñā-n-* and the first singular suffix **-n* in: first person singular **yā-n-* (obl. **yă-n-*), alternative first person singular **ñā-n-* (obl. **ñă-n-*, also **ñā-*) > Tamil *yāṉ*, *ñāṉ* 'I'; Malayalam *ñān* 'I'; Kota *a·n* 'I'; Toda *o·n* 'I'; Kannaḍa *ān*, *nān* 'I'; Koḍagu *na·nï*, *na·* 'I'; Tuḷu *yānu*, *yēnu* 'I'; Telugu *ēnu*, *nēnu* 'I'; Kolami *a·n* 'I'; Naikṛi *ān* 'I'; Parji *ān* 'I'; Gadba *ān* 'I'; Gondi *anā*, (emph.) *annā*, *nannā*, *nanā*, *nana* 'I'; Konḍa *nān(u)* 'I';

Pengo *ān*/*āneŋ* ‘I’; Manḍa *ān* ‘I’; Kui *ānu*, *nānu* ‘I’; Kuwi *nānū* ‘I’; Kuṛux *ēn* ‘I’; Malto *én* ‘I’; Brahui *ī* ‘I’ (cf. Burrow—Emeneau 1984:468, no. 5160). It also occurs as the first singular suffix in finite verbs *-V̆n > Old Tamil -*ĕ̲ṉ*, -*a̲ṉ*; Old Malayalam -*ēn*, -*an*; Kota -*ē(n)*; Iruḷa -*e*/-*en*; Toda -*en*, -*in*, -*n*; Kannaḍa -*eM*; Telugu -*nu*, -*ni*; Kolami -*un*, -*n*, -*an*; Kui -*enu*; Kuwi -*ni*; Koṇḍa -*a*; Gadba -*an*, -*on*, -*en*, -*n*; Pengo -*aŋ*; Naikṛi -*un*, -*n*, -*an*; Parji -*on*, -*en*, -*an*, -*in*, -*n*; Kuṛux -*n*; Malto -*in*, -*en*, -*on*. Cf. Krishnamurti 2003:244—245 and 308—312.

C. Indo-European: Note Tocharian B first singular (nom.) *ñäś/ñiś* ‘I, me’, Tocharian A *näṣ* (nom. m.)/*ñuk* (nom. f.) ‘I, me’. Initial *ñ-* may be derived from earlier **ṇ̡(ä-)* (ultimately < **n-i-* ?). Indo-Europeanists have been at a loss about how to account for the Tocharian forms (cf. Adams 1999:265—266), and most of the explanations offered to date have been makeshift at best. Assuming that Tocharian has preserved an original **n(-i)-*, which has been lost elsewhere within Indo-European, may be a simpler explanation. This is quite speculative, however.

D. Altaic: In Mongolian, besides **min-*, there is an alternative stem **na-ma-*, which serves as a base for the oblique cases of the first person personal pronoun: Middle Mongolian *namay*, *nadur* ~ *nada*; Dagur *namda*, *nada*; Monguor *ndā*; Moghol *nanda*; Ordos *namādu*, *nada*; Khalkha *nad-*, *namay(g)*; Buriat *namda*, *namā(yi)*; Kalmyk *nan-*, *namā̆(g)*. Cf. Poppe 1955:209—212. Poppe notes that the origin of this stem is not clear, but he mentions the fact that **na-* is identical with Korean *na* ‘I’. Starostin—Dybo—Mudrak 2003:1024 reconstruct Proto-Altaic **ŋa* first person pronoun. They note: “The root serves as oblique stem in Mong[olian], which may have been its original function…”

E. Gilyak / Nivkh: Independent first person singular personal pronoun (Amur) *ńi* ‘I’. Note also first person plural (Amur) *ńyŋ* ‘we’ (exclusive). Cf. Gruzdeva 1998:25.

Sumerian: In Emegir, the first singular (subject) is *g̃á.e* (= /ŋa-/) ‘I’. This may belong here if we assume that the original form contained an initial velar nasal, which was retained in Sumerian, having been replaced by a dental nasal in Nostratic (except perhaps in Dravidian [cf. Krishnamurti 2003:245—249]).

16.7. First person plural exclusive **na* (~ **nə*) (Greenberg: §3. First-Person N; Dolgopolsky 1984:90 **nV* ‘we’ [exclusive] and 2008, no. 1526, **nīV* ‘we’ [exclusive])

A. Afrasian: Proto-Afrasian **na-* ~ **ni-* ~ **nu-* first person plural personal pronoun stem: ‘we’ > Proto-Semitic independent 1st pl. personal pronoun **naḥnŭ* ‘we’ > Hebrew *(ʾă)naḥnū* ‘we’; Aramaic *ʾănaḥnā(n)* ‘we’; Old Babylonian *nīnu* ‘we’; Arabic *naḥnu* ‘we’; Śḥeri / Jibbāli *nḥán* ‘we’; Ḥarsūsi *neḥā* ‘we’; Mehri *neḥā n-* ‘we’; Geez / Ethiopic *nəḥna* ‘we’; Tigrinya *nəḥna* ‘we’. Cf. Moscati 1964:105, §13.10; Lipiński 1997:298—306. Old Egyptian *n* ‘we’ (also *ỉnn*); Coptic *anon* [ⲁⲛⲟⲛ], *an-* [ⲁⲛ-], *ann-* [ⲁⲛⲛ-] ‘we’. Cf. Hannig

1995:77 and 387; Faulkner 1962:23 and 124; Erman—Grapow 1921:14, 76 and 1926—1963.1:97, 2:194—195; Gardiner 1957:53, 554, and 572; Vycichl 1983:13; Černý 1976:9. Berber: Tamazight (independent) *nəkni* 'we', (indirect, after prepositions) *nəx*; Tuareg (independent) *nəkkaniḍ*. Common East Cushitic **na*/**ni*/**nu* 'we' > Burji *náanu* 'we', *nín-ka* 'our', *nín-si* 'us'; Gedeo / Darasa (nom. pl.) *noʾo* 'we', (acc. pl.) *noʾo(o)* 'us', (dat. pl.) *noʾoʾá*, *noʾá* 'to us', (poss.) (m.) *noʾo-ka*, (f.) *noʾo-ttʾa* 'our'; Hadiyya (nom. pl.) *neese* 'we', (acc. pl.) *ne(e)s* 'us', (dat. pl.) *niin* 'to us', (poss.) *ni-* 'our'; Kambata (nom. pl.) *naʾooti* 'we', (acc. pl.) *ne(e)s*, *-nne* 'us', (dat. pl.) *nesá* 'to us', (poss.) *-nne* 'our'; Sidamo (nom.-acc. pl.) *ninke* 'we', (dat. pl.) *ninke-ra* 'to us', (poss.) *-nke* 'our'; Saho *nanu* 'we'; Galla / Oromo (Wellegga) first plural present suffixes (affirmative) *-na*, (negative) *-nu*, independent (subject) *nuy*, (base) *nu*. Sasse (1982:151) reconstructs Common East Cushitic **na*/**ni*/**nu* 'we', which "is sometimes provided with a suffix *-ni*/*-nu* in the subject case". Cf. Hudson 1989:161 and 165. Proto-Southern Cushitic **nana*, **nani* 'we' > Maʾa *níne* 'we'; Dahalo *nányi*/*nyányi* 'we'. Cf. Ehret 1980:184. Omotic: Dizi first plural suffixes (with auxiliary) *-n*, (without auxiliary) *-ńno*, (subject) *inu*, (object) *in*, (possessive affix) *ń-*. Bender (2000:196) reconstructs a Proto-Omotic first person plural independent personal pronoun **nu* 'we' > Zayse (inclusive/exclusive) *nu*/*ni* 'we'; Harro *na* 'we'; Chara *noone* 'we'; Bench / Gimira (inclusive/exclusive) *nu*/*ni* 'we'; Bworo *nu*, *ni* 'we'. Proto-Semitic **-nă̆* 1st pl. personal pronoun suffix, **na-*/**ni-* 1st pl. personal pronoun prefix > Hebrew *-nū*, *ni-*; Aramaic *-n(ā)*, *ne-*; Ugaritic *-n*, *n-*; Akkadian *-āni*, *-ānu*; *ni-*; Arabic *-nā*, *na-*; Geez / Ethiopic *-na*, *nə-*; Tigre *-na*. Cf. Moscati 1964:106, §13.14; R. Stempel 1999:80; Lipiński 1997:306—311. The following first person plural suffixed personal pronouns are found in other Afrasian daughter languages: Egyptian *-n*; Coptic *-n* [-ⲛ]. Berber: Tuareg *-na*, *-nə*. Cushitic: Beja / Beḍawye *-n*. For Southern Cushitic, Ehret (1980:65) lists the following first person plural conjugational affixes: Burunge *-an*; Iraqw *-an*; Dahalo *-Vnu*.

B. Dravidian: Proto-Dravidian first person plural (inclusive) **ñā-m-* (obl. **ñă-m(m)-*) > Tamil *nām* (obl. *nam(m)-*) 'we'; Malayalam *nām* (obl. *nam(m)-*) 'we'; Kannaḍa *nāvu* (obl. *nam-*) 'we'; Tuḷu *nama* 'we'; Kolami *ne·nḍ* 'we'; Naikṛi *nēnḍ*, *nēm* 'we'; Kuṛux *nām* 'we'; Malto *nám* 'we'; Brahui *nan* 'we' (cf. Burrow—Emeneau 1984:322, no. 3647; Krishnamurti 2003:247—248).

C. Kartvelian: Svan *näj* 'we' (Tuite 1997:18 writes *næj*).

D. Indo-European: Proto-Indo-European (personal pronoun of the first person dual and plural) **ne-*/**no-*/**n̥-s-* 'we, us' > Sanskrit (acc.-dat.-gen. dual) *nau* 'us', (acc.-dat.-gen. pl.) *nas*; Latin *nōs* 'we'; Greek (nom. du.) νώ 'we two'; Gothic (acc.-dat. pl.) *uns*, *unsis* 'us', (gen. pl.) *unsara*; Old Church Slavic (acc. pl.) *nasъ*, *ny*, (acc. du.) *na*, (dat. pl.) *namъ*, *ny*, (gen.-loc. pl.) *nasъ*, (instr. pl.) *nami*. Cf. Pokorny 1959:758; Beekes 1995:207—209; Szemerényi 1996:211—220; Brugmann 1904:407—413; Burrow 1973:263—269; Sihler 1995:372—373; Fortson 2004:127 and 2010:141—142; Meillet 1964:335—336.

16.8. First person (postnominal possessive/preverbal agentive) **ʔiya* (not in Greenberg 2000; Dolgopolsky 1984:85—87 **HoyV* [a] 'by me', [b] agent marker of the 1st sg. of verbs, [c] postnominal possessive pronoun ['my'])

A. Afrasian: Proto-Afrasian **ʔiya* first person suffixed personal pronoun stem: Proto-Semitic **-(i)ya* first person singular suffixed personal pronoun > Old Babylonian *-ī*, *-ya*; Ugaritic *-y*; Hebrew *-ī*; Aramaic *-ī*; Classical Arabic *-ī*, *-ya*; Mehri *-i*, *-yä*; Geez / Ethiopic *-ya*; Tigre *-ye*; Tigrinya *-äy* (cf. Moscati 1964:106, §13.14; O'Leary 1921:149—150; Lipiński 1997:306—307 and 308; Gray 1934:63—64; W. Wright 1890:95—98). Egyptian *-i̯* 1st singular suffix: 'I, me, my' (cf. Erman—Grapow 1926—1963.1:25; Gardiner 1957:39 and 550; Faulkner 1962:7; Hannig 1995:21). Berber: Tuareg *-i*, *-iyi* 'me, to me'; Kabyle *-i*, *-iyi*, *-yi* 'me, to me', *-i* 'me' as in: *fəll-i* 'for me', *yid-i* 'with me', *əɣṛ-i* 'towards me', *gar-i d-ṛəbbi* 'between me and God', *wəḥd-i* 'me alone', *zdat-i* 'in front of me'; Tamazight (1st sg. direct object pronoun, placed either before or after verbs according to the syntactic conditions) *i*, *yi*. Proto-East Cushitic **ya*/**yi* 'me, my' > Saho *yi* 'me'; Afar (poss.) *yi* 'my'; Burji (1st sg. abs. [obj.]) *ee* 'me', *íi-ya* 'my'; Arbore *ye-* 'me'; Dasenech *ye-* 'me'; Elmolo *ye-* 'me'; Kambata *e(e)s* 'me'; Hadiyya *e(e)s* 'me'; Sidamo *-e* 'me'; Dullay *ye* 'me'; Yaaku *i(i)* 'me' (cf. Sasse 1982:67 and 104; Hudson 1989:97; Heine 1978:53). Proto-Southern Cushitic **ʔe*/**ʔi* 'my' > Iraqw *e* 'my'; Burunge *ayi* 'my'; Alagwa *i* 'my'; K'wadza *-ʔe* 'my'; Dahalo *ʔi* 'my' (cf. Ehret 1980:289). Cf. Ehret 1995:478, no. 1011, **i* or **yi* 'me, my' (bound 1st sg. pronoun); Diakonoff 1988:76—77.

B. Elamo-Dravidian: McAlpin (1981:112—114, §531.0) reconstructs a Proto-Elamo-Dravidian **i* 'I'. In Elamite, this became *u* 'I'. McAlpin assumes that the following developments took place in Dravidian: **i-ən* > **i̯ən* [**yən*] > (with vowel lengthening in accordance with Zvelebil's Law) **yān* 'I' > Tamil *yāṉ* 'I'; Kota *a·n* 'I'; Toda *o·n* 'I'; Kannaḍa *ān* 'I'; Tuḷu *yānu*, *yēnu* 'I'; Telugu *ēnu* 'I'; Kolami *a·n* 'I'; Naikṛi *ān* 'I'; Parji *ān* 'I'; Gadba *ān* 'I'; Gondi *anā*, (emph.) *annā* 'I'; Pengo *ān*/*āneŋ* 'I'; Manḍa *ān* 'I'; Kui *ānu* 'I'; Kuṛux *ēn* 'I'; Malto *én* 'I'; Brahui *ī* 'I' (cf. Burrow—Emeneau 1984:468, no. 5160). Cf. also Caldwell 1913:359—373; Zvelebil 1990:24—26 (1st sg. nom.) **yān* 'I', (obl.) **yan-*, (1st pl. excl. nom.) **yām* 'we', (obl.) **yam-*; Steever 1998a:21 (1st sg. nom.) **yān*, (obl.) **yan-*/**(y)en-*; Krishnamurti 2003:245 **yān*/**yan-* 'I'; Bloch 1954:30—31.

16.9. Second person **tʰi* (~ **tʰe*), (oblique form) **tʰa* (~ **tʰə*) (Greenberg: §4. Second-Person T; Illič-Svityč 1971—1984.I:6 **ṭi* and I:7 **ṭä*; Dolgopolsky 1984:87—88 **ṭ[ü]* and 2008, no. 2312, **ṭ[ü]* (> **ṭi*) 'thou'; Starostin—Dybo—Mudrak 2003:1424 Proto-Nostratic **t'i* 'thou'; Nafiqoff 2003:62—65 **ti* 'thou'; Fortescue 1998:96—123)

A. Afrasian: In Semitic, this stem occurs first as the second component in the second person independent pronoun: cf. Arabic (second person sg. m.) *ʔanta* (= *ʔan-+ta*) 'you', (f.) *ʔanti* (= *ʔan-+ti*); (m.) Akkadian *attā* 'you', (f.) *attī*; Ugaritic (m./f.) *ȧt* 'you'; Hebrew (m.) *ʔattā* 'you', (f.) *ʔatt*; Geez / Ethiopic (m.) *ʔanta* 'you', (f.) *ʔantī* (cf. Moscati 1964:102: "The first and second persons singular and plural belong to the same system [*'an-* plus suffixes] ..."; note also Diakonoff 1988:70: "[t]he independent personal pronouns in the direct [absolute] case may be introduced by a special demonstrative element: Sem[itic] *'an-*, Eg[yptian] *i̯n-* and *nt-*, Berb[er] *n-*, *nt-*, Cush[itic] *an*, *a-*"). Next, it appears as a second person personal affix, prefixed in the imperfect ("atelic") and suffixed in the perfect ("telic") (for comparison of Proto-Semitic with Berber and Cushitic, cf. Diakonoff 1988:80):

	Imperfect	Perfect
Masculine	**ta-*	**-t-a*
Feminine	**ta-...-ī*	**-t-ī*

Suffixed forms (cf. Lipiński 1997:360—361): Akkadian (m.) *-āt(a/i)*, (f.) *-āti*; Ugaritic (m./f.) *-t*; Hebrew (m.) *-tā*, (f.) *-t*; Aramaic (m.) *-t*, (f.) *-tī*; Arabic (m.) *-ta*, (f.) *-ti*. Prefixed forms (cf. Lipiński 1997:370—371): Old Akkadian (m.) *ta-*, (f.) *ta-...-ī*; Ugaritic (m.) *t-*, (f.) *t-...-n*; Hebrew (m.) *ti-*/*ta-*, (f.) *ti-*/*ta-...-ī*; Arabic (m.) *ta-*, (f.) *ta-...-ī*; Mehri (m.) *tə-*, (f.) *tə-...-i*; Geez / Ethiopic (m.) *tə-*, (f.) *tə-...-i*; Amharic (m.) *tə-*, (f.) *tə-...-i*. In later Egyptian, it forms part of the second person independent personal pronoun: (m. sg.) *nt-k* 'you', (f. sg.) *nt-t̲*; (m. pl.) *nt-t̲n*, (f. pl.) *nt-sn*. In Berber, this stem also appears as a second person personal affix (cf. Tashelhiyt second person personal affix (m./f.): *t-...-t*), and likewise in Beja / Beḍawye (Cushitic) (second person personal prefix, "old" conjugation: [m.] *te-... -a*, [f.] *te-...-i*). Also note the Highland East Cushitic second person singular subject pronouns: Burji *a-ši*; Gedeo / Darasa *a-ti*; Hadiyya *a-ti*; Kambata *a-ti*; Sidamo *a-ti*; and the conjunctive suffixes (sg.): Burji *-ši*; Gedeo / Darasa *-tee*; Hadiyya *-ta*; Kambata *-ti(keʔi)*; Sidamo *-te*. Cf. Sasse 1982:29 (Proto-East Cushitic **ʔat-i/u*); Hudson 1989:172, 405, and 423. In Southern Cushitic, note the Dahalo second singular independent pronoun: (m.) *ʔát:à*, (f.) *ʔàt:à* (cf. Ehret 1980:282). Ehret (1980:65) lists the following second person singular and plural conjugational affixes for Southern Cushitic:

	Burunge	Iraqw	Dahalo	Proto-Southern Cushitic
2nd sg.	*-id*	**-it*	*-Vt̲o*	**-ito*
2nd pl.	*-idey*	**-ta*	*-Vt̲e*	**-ite*

B. Elamo-Dravidian: In Proto-Elamo-Dravidian, this stem appears as the second singular appellative ending **-ti* > Proto-Elamite **-tə*; Proto-Dravidian **-ti* (cf.

McAlpin 1981:120, §542.3). Cf., for example, the conjugation of *hutta-* ‘to do, to make’ in Middle Elamite:

Person	Singular	Plural
1	*hutta-h*	*hutta-hu* (< *-h*+*h*)
2	*hutta*-t	*hutta-h*t (< *-h*+t)
3	*hutta-š*	*hutta-hš* (< *-h*+*š*)

Note also the allocative *-t* in Elamite in, for example, *katu-k*-t ‘you, living’. For Dravidian, McAlpin cites the Brahui second person singular ending *-s* as a possible reflex of Proto-Dravidian **-ti* but is careful to note that this is uncertain.

C. Indo-European: Proto-Indo-European second person singular personal pronoun stem **$t^h\check{u}$*: cf. Hittite (acc.-dat. sg.) *tu-uk*, *tu-ga*; Palaic (acc.-dat. sg.) *tu-ú*; Hieroglyphic Luwian (poss.) *tuwa-*; Sanskrit (nom. sg.) *tvám* ‘you’; Avestan (nom. sg.) *twəm*, *tŭm*; Greek (nom. sg.) σύ ‘you’ (Doric τύ); Old Latin (nom. sg.) *tū* ‘you’; Gothic (nom. sg.) *þu* ‘you’; Old Church Slavic (nom. sg.) *ty* ‘you’ (cf. Szemerényi 1996:211—221 nom. sg. **tu*/**tū*, acc. sg. **twe*/**te* ~ **twē*/**tē* ~ **twēm*/**tēm*; Pokorny 1959:1097—1098 nom. sg. **tŭ*, acc. sg. **te*; Walde 1927—1932.I:745; Burrow 1973:263—269; Beekes 1995:209; Meier-Brügger 2003:225—227; Fortson 2010:142; Meillet 1964:333—335). The data from the Anatolian branch indicates that the original form must have been **$t^h\check{\imath}$*: cf. Hittite (nom. sg.) *zi-ik* ‘you’; Palaic (nom. sg.) *ti-i*; Hieroglyphic Luwian (nom. sg.) *ti*. As a verb ending, **-t^h-* is preserved only in Hittite and Tocharian in the second person singular: cf. Hittite (2nd sg. pret.) *-ta* in, for example, *e-eš-ta* ‘you were’; Tocharian A (2nd sg. athematic) *-(ä)t*, B *-(ä)t(o)*. This was later replaced by the ending **-s-*. In the second person plural, however, **-t^h-* is found in all of the older daughter languages: Proto-Indo-European (athematic) **-t^he*; (primary) **-t^he-s-i*, **-t^he-n-i*; (secondary) **-t^he-s*, **-t^he-n* — with ablaut variants: Hittite (primary) *-teni*, (secondary) *-ten*; Sanskrit (primary) *-tha*, *-thana*, (secondary) *-ta*, *-tana*; Avestan (primary) *-θa*, (secondary) *-ta*; Greek (primary/secondary) -τε; Old Latin (primary/secondary) *-tis*; Gothic (primary/secondary) *-þ*; Lithuanian (primary/secondary) *-te*; Old Church Slavic (primary/secondary) *-te* (cf. Beekes 1988:153 and 1995:232; Burrow 1973:309; Brugmann 1904:591—592; Szemerényi 1996:233—234; Fortson 2004:84—85 and 2010:91—92; Watkins 1998:60).

D. Uralic-Yukaghir: Proto-Uralic second person singular personal pronoun: (Abondolo 1998a:20) **tV* ‘you, thou’; (Rédei 1986—1988:539) **tŭ̈*; (Collinder 1965:144) **tinä* ~ **tyna*; (Décsy 1990:57) (sg.) **te*, (pl.) **te(kä)*: (a) singular: Finnish *sinä*/*sinu-* ‘you’; Lapp / Saami *don* ~ *dú-* ‘you’; Mordvin *ton* ‘you’; Cheremis / Mari *təń* ‘you’; Votyak / Udmurt *ton* ‘you’; Zyrian / Komi *te* (acc. *tenõ*) ‘you’; Hungarian *të* ‘you’; Selkup Samoyed *taŋ*, *tat* ‘you’; Tavgi Samoyed / Nganasan *tannaŋ* ‘you’; Yenisei Samoyed / Enets *tod'i* ‘you’; Kamassian *tan* ‘you’; (b) plural: Finnish *te* ‘you’; Lapp / Saami *dí* ‘you’;

Mordvin (Erza) *tiń*, *tïń* ‘you’; Cheremis / Mari *tä*, *te* ‘you’; Votyak / Udmurt *ti* ‘you’; Zyrian / Komi *ti* ‘you’; Hungarian *ti* ‘you’; Tavgi Samoyed / Nganasan *teeŋ* ‘you’; Yenisei Samoyed / Enets *tod'iˀ* ‘you’; Selkup Samoyed *tee*, *tii* ‘you’; Kamassian *šiˀ* ‘you’. Proto-Uralic second person possessive/personal suffix **-t*: Finnish *pala-t* ‘you burn’; Mordvin *vana-t* ‘you see’; Cheremis / Mari *wide-t* ‘you lead’; Votyak / Udmurt *baśtiśko-d* ‘you take’ (cf. Collinder 1960:310). In Yukaghir (Northern / Tundra), the second person independent pronouns are: (sg.) *tet* ‘you, thou’ and (pl.) *tit* ‘you’ (cf. Greenberg 2000:71).

E. Altaic: Proto-Altaic (nom. sg.) **tʰi* ‘thou, you’: Proto-Mongolian (nom. sg.) (**tʰi* > **tʸi* >) *či* ‘you’, (nom. pl.) **ta* ‘you’ > Written Mongolian (nom. sg.) *či* ‘you’ (gen. *činu*), (nom. pl.) *ta*; Dagur (nom. sg.) *šī* ‘you’, (nom. pl.) *tā*; Monguor (nom. sg.) *ći* ‘you’, (nom. pl.) *ta*; Ordos (nom. sg.) *či* ‘you’, (nom. pl.) *ta*; Khalkha (nom. sg.) *či* ‘you’, (nom. pl.) *ta*; Buriat (nom. sg.) *ši* ‘you’, (nom. pl.) *tā*; Moghol (nom. sg.) *či* ‘you’, (nom. pl.) *to*; Kalmyk (nom. sg.) *či* ‘you’, (nom. pl.) *ta*. Cf. Poppe 1955:35, 104, 112, 213, and 218; Starostin—Dybo—Mudrak 2003:1424 **t'i* ‘thou’. Starostin—Dybo—Mudrak note: “Mongolian has alone preserved the Nostratic 2nd p[erson personal pronoun] stem **t'i*; other Altaic languages have retained only the other stem **si* (**s̯ia*), with the oblique stem **nV*.”

F. Chukchi-Kamchatkan: Proto-Chukchi-Kamchatkan **tu-r(i)* ‘you’: Chukchi *turi* ‘you’, *turɣ-in* ‘your’; Kerek (pl.) *təjəkku* ‘you’, (dual) *təəj* ‘you’, *təjəj* ‘your’; Koryak (pl.) *tuju* ‘you’, (dual) *tuji* ‘you’, *tucɣ-in* ‘your’; Alyutor (pl.) *turuwwi* ‘you’; Kamchadal / Itelmen *tuzaˀn* ‘you’, *tizvin* ‘your’. Cf. Fortescue 2005:291. Proto-Chukchi-Kamchatkan **-ð* in **kəð* ‘you’: Chukchi *ɣət* (Southern *ɣəto*) ‘you’; Kerek *hənŋu* ‘you’; Koryak *ɣəcci* ‘you’; Alyutor *ɣətta*, *ɣəttə* (Palana *ɣətte*) ‘you’; Kamchadal / Itelmen *kəz(z)a* (Sedanka *kza*) ‘you’. Cf. Fortescue 2005:142—143; Greenberg 2000:72—73 and 79.

G. Gilyak / Nivkh: Second person singular pronoun (Amur) *či* ‘you, thou’, (pl.) *čyŋ* ‘you’ (cf. Gruzdeva 1998:26). Greenberg (2000:72 and 75) waivers between placing the Gilyak stem here or with Proto-Nostratic **si*.

H. Etruscan: Perhaps *θi* — the meaning is unknown, but it may be the second person personal pronoun in view of the second singular imperative endings *-ti*, *-θ*, *-θi* (cf. Bonfante—Bonfante 2002:103). However, it should be noted that the accusative of the second person personal pronoun appears as *un* ‘you’ in the Zagreb mummy wrappings (cf. Bonfante—Bonfante 2002:91).

16.10. Second person **si* (~ **se*) (Greenberg: §5. Second-Person S; Dolgopolsky 2008, no. 2006a, **ś[ü]* [> ***śi*] ‘thou’; Illič-Svityč 1971—1984.I:6 **Si*)

When I was doing research for my co-authored book *The Nostratic Macrofamily*, I considered the evidence for a second person pronoun stem **si* and rejected it. At that time, I thought that this stem may have been secondarily derived, at the Proto-Nostratic level, from **tʰi* as follows: **tʰi* > **t͡si* > **si*. I thought that the Kartvelian second person pronoun **si-* may ultimately have had the same origin (**si* < **t͡si* <

*t^hi). However, I reasoned that the original stem must not have been lost either, so that there was a split which resulted in two competing forms at the Proto-Nostratic level. Considering the evidence Greenberg presents, my former views should be abandoned, and two distinct second person pronoun stems should be recognized, namely, *t^hi and **si*. This is certainly much more straightforward than the scenario I had previously envisioned.

A. Kartvelian: Note the second person verb prefix *s-* found in Old Georgian (present) *s-c'er* 'you write' and the second singular personal pronoun in Mingrelian *si* 'you', Laz *si(n)* 'you', and Svan *si* 'you' (cf. Tuite 1997:18). Klimov (1998:164) reconstructs Proto-Kartvelian **sen* 'you' (sg.), while Fähnrich—Sardshweladse (1995:300) reconstruct **si-* 'you' (sg.) (variant form **si-n-* with secondary *-n-*), as does Fähnrich (2007:366). In Georgian, this stem has been replaced by that of the possessive pronoun: *šen-* 'you' (< **škwe[n]-*). The Kartvelian evidence strengthens the case for an independent second person pronoun stem **si* in Proto-Nostratic.

B. Indo-European: In Indo-European, this stem is found only in the second person singular verbal endings (primary) **-s-i*, (secondary) **-s* > Sanskrit (primary) *-si*, (secondary) *-s*; Avestan (primary) *-si*, (secondary) *-s*; Hittite (primary) *-ši*, (secondary) *-š*; Greek (primary) -σι, (secondary) -ς; Old Latin (primary/secondary) *-s*; Gothic (primary/secondary) *-s*; Old Church Slavic (primary) *-si*/*-ši*; Lithuanian (primary) *-si*. It appears that there were originally two competing endings of the second person singular in Proto-Indo-European: (A) *-t^h, which is preserved only in Hittite and Tocharian, and (B) **-s(i)*, which is also found in Hittite as well as in the non-Anatolian daughter languages other than Tocharian. It is clear that the **-s(i)* ending ousted the *-t^h ending in the singular in the non-Anatolian daughter languages, while the *-t^h ending was preserved intact in the plural. Cf. Beekes 1995:232—234; Brugmann 1904:590; Meillet 1964:227—228, 229, and 1965:316—318; Szemerényi 1996:233—236; Burrow 1973:306—314; Fortson 2004:84—85 and 2010:92—93.

C. Altaic: This stem is found in Tungus, and Turkic: Proto-Altaic **si* second person singular pronoun: 'you': Proto-Tungus **si*, **sū* second person singular pronoun: 'you' > Manchu *si* 'you'; Spoken Manchu (Sibo) *ši* 'you'; Evenki *si* 'you'; Lamut / Even *hī* 'you'; Negidal *sī* 'you'; Ulch *si* 'you'; Orok *si* 'you'; Nanay / Gold *śi* 'you'; Oroch *si* 'you'; Udihe *si* 'you'; Solon *ši* 'you'. Second person singular possessive suffixes: Lamut / Even (after vowels) *-s*, (after consonants) *-as*, (after *n*) *-si*; Evenki (after vowels) *-s*, (after consonants) *-is*. Proto-Turkic **sę-* second person singular pronoun: 'you' > Old Turkic *sen* 'you'; Turkish *sen* 'you'; Azerbaijani *sän* 'you'; Turkmenian *sen* 'you'; Tatar *sin* 'you'; Bashkir *hin* 'you'; Karaim *sïn* 'you'; Kazakh *sen* 'you'; Kirghiz *sen* 'you'; Noghay *sen* 'you'; Uzbek *sän* 'you'; Uighur *sen* 'you'; Tuva *sen* 'you'; Yakut *en* 'you'; Chuvash *esĕ* 'you'. Second person singular possessive suffixes/personal markers: Turkish *-sIn*; Kazakh *-sIŋ*; Kirghiz *-sIŋ*; Uzbek *-sən*. Cf. Johanson—Csató 1998; Starostin—Dybo—Mudrak 2003:1237—1238.

16.11. Second person **ni* (~ **ne*) and/or **na* (~ **nə*) (Greenberg: §6. Second-Person N)

While the evidence for this stem in Eurasiatic is not plentiful, it is found in other Nostratic languages. However, the evidence is somewhat controversial, especially in Afrasian, where it is found only in Omotic. Nonetheless, the evidence is compelling enough to make it seem likely that this stem should be reconstructed for Proto-Nostratic. The vowel is difficult to reconstruct — Afrasian and Dravidian point to original **ni* (~ **ne*), while Altaic points to **na* instead.

A. Afrasian: Interestingly, this stem exists in Omotic (cf. Zayse second singular [subject] *né[j]* 'you', bound form *-n*; Bench / Gimira [subject] *nen*[3] 'you', [oblique] *ni*[4]; Yemsa / Janjero *ne* 'you'; etc.). Bender (2000:196) reconstructs a Proto-Omotic second person singular independent personal pronoun **ne* 'you'. Bender (2000:197) implies, however, that there may have been a reversal of the Afrasian **n* (first person) ~ **t* (second person) pattern to **t* (first person) ~ **n* (second person) in Omotic. But note the patterning in Elamite (below).
B. Elamo-Dravidian: The possessive pronouns of the second series, or the possessive pronouns proper in Achaemenid Elamite were: (1st person sg.) *-ta*, (2nd person sg.) *-ni*, (3rd person sg.) *-e* (cf. Khačikjan 1998:26—27). Middle Elamite second person singular personal pronoun (nom. sg.) *ni* ~ *nu* 'you, thou' (Old Elamite *ni*), (pl.) *num*, *numi* 'you'. The Proto-Dravidian second person pronoun has been reconstructed as (sg.) **nĭ̄n-*, (pl.) **nĭ̄m-* > (a) singular: Tamil *nī* 'you'; Malayalam *nī* 'you' (obl. *nin(n)-*); Kota *ni·* 'you'; Toda *ni·* 'you'; Kannaḍa *nīṃ*, *nīn(u)* 'you'; Koḍagu *ni·nï*/*ni·* 'you'; Telugu *nīvu* 'you'; Kolami *ni·v* 'you'; Naikṛi *nīv* 'you'; Konḍa *nīn* 'you'; Kuwi *nīnū* 'you'; Kuṛux *nīn* 'you'; Malto *nín* 'you'; Brahui *nī* 'you'; (b) plural: Tamil *nīm*, *nīr*, *nīyir*, *nīvir*, *nīñkaḷ* 'you'; Malayalam *niṅṅaḷ* 'you'; Kota *ni·m* 'you'; Toda *nïm* 'you'; Kannaḍa *nīm*, *nīvu*, *nīngaḷ* 'you'; Koḍagu *niŋga* 'you'; Kolami *ni·r* 'you'; Naikṛi *nīr* 'you'; Kuṛux *nīm* 'you'; Malto *ním* 'you'; Brahui *num* 'you' (cf. Krishnamurti 2003:249—252; Burrow—Emeneau 1984:327, no. 3684, and 328, no. 3688). McAlpin (1981:114—115) reconstructs Proto-Elamo-Dravidian second person singular independent personal pronoun **ni* 'you, thou', possessive clitic **-ni*. For the second person plural, he reconstructs Proto-Elamo-Dravidian **nim*.
C. Uralic: Greenberg (2000:76—77) notes that there is some evidence for a second person personal pronoun *n-* in Uralic, especially in Ob-Ugric. However, as he rightly points out, this evidence is extremely controversial and has been variously explained by specialists. As noted by Marcantonio (2002:226): "…the Possessive endings of the 2nd Singular in Vogul and Ostyak differ, yet again, from those of Hungarian and other U[ralic] languages; in fact, Vogul and Ostyak have the ending *-(V)n* and not *-t* as reconstructed for P[roto]-U[ralic]. Compare Hun[garian] *ház-a-d* vs Finn[ish] *talo-si* 'your house' vs Vog[ul] *ula-n* 'bow-your' (Keresztes 1998: 411). Several connections have been proposed for *-(V)n* (compare for example Sinor 1988: 733; Hajdú 1966:

132-3). Among these connections, one may consider that of the formant *-n-* in P[roto]-Samoyed. As Janhunen puts it (1998: 471):

> From the Proto-Uralic point of view, one of the most interesting features is that the second-person singular predicative ending seems to have been *-n* in proto-Samoyedic, as opposed to **-t* in most sub-branches of Finno-Ugric.

According to Collinder (1965a: 134), there might have been two words to indicate 'you': **-t* and **-n*; …"

D. Altaic: Starostin—Dybo—Mudrak (2003:959) reconstruct Proto-Altaic **na* 'thou' on the basis of: (a) Proto-Turkic **-ŋ* an ending of the second person > Old Turkic (Orkhon, Old Uighur) *-ŋ*; Karakhanide Turkic *-ŋ*; Turkish *-n*; Gagauz *-n*; Azerbaijani *-n*; Turkmenian *-ŋ*; Uzbek *-ŋ*; Uighur *-ŋ*; Karaim *-n*, *-y*; Tatar *-ŋ*; Bashkir *-ŋ*; Kirghiz *-ŋ*; Kazakh *-ŋ*; Noghay *-ŋ*; Oyrot (Mountain Altai) *-ŋ*; Tuva *-ŋ*; Chuvash *-n*; Yakut *-ŋ*; (b) Proto-Japanese **na* 'thou' > Old Japanese *na* 'thou'; (c) Proto-Korean **nə* 'thou' > Middle Korean *nə* 'thou' > Modern Korean *ne* 'thou' (cf. Sohn 1999:207). They note: "Velarization in Turkic is not quite clear and probably secondary (perhaps a fusion with the attributive **-k'i*). The root is widely used only in the Kor[ean]-J[apanese] area, and its original function (to judge from the O[ld] J[apanese] opposition of *si* and *na*) was probably limited to the oblique stem of the suppletive 2nd p[erson] paradigm."

16.12. Pronominal stem of unclear deictic function **-gi* (~ **-ge*) (Greenberg: §7. Pronoun Base GE)

A. Kartvelian: This element occurs in Kartvelian: cf. Old Georgian demonstrative stems *ege* 'that' and *igi* 'that yonder' (cf. Fähnrich 1994:72), which are to be analyzed as *e*+*ge* and *i*+*gi* respectively. Cf. also Klimov 1998:24; Fähnrich—Sardshweladse 1995:73; Fähnrich 2007:92.

B. Indo-European: Within Indo-European, the only evidence for **ʔe-gʰŏ-m*, with *-gʰ-*, comes from Indo-Iranian (and perhaps Slavic). Elsewhere, the evidence from the daughter languages points to earlier **ʔe-k'ŏ-m* (Greek, Latin, Germanic) or even **ʔe-kʰŏ-m* (Lithuanian and Armenian). What this implies is that there were multiple pronominal elements involved (at least in Indo-European), not just **-gʰ-*. Thus, the basic pronominal stem was **ʔe-*, to which various elements were added: **ʔe-*+*gʰŏ*+*-m*, **ʔe-*+*k'ŏ*+*-m*, **ʔe-*+*kʰŏ*+*-m*. This stem appears to be a late formation within Indo-European, though it is found in Anatolian (cf. Hittite *ú-uk*, *ú-ga*, *ú-ug-ga* 'I', with analogical *u-*). It should be noted that the same **-gʰ-* element may occur in the dative singular in Sanskrit *máhya(m)* 'to me' and Italic (Latin *mihī*; Umbrian *mehe*) < **me-gʰ-* (cf. Burrow 1973:263—264; Poultney 1959:65, §48a, and 108, §107a; Palmer 1954:254; Kapović 2017c:82), though some Indo-Europeanists take these forms to be a

reflex of Proto-Indo-European **me-b^h-* instead (cf., for example, Szemerényi 1996:214—215; Sihler 1995:377—378). Finally, **g^{h}e-* may be preserved as an independent pronominal stem in Latin *hĭc*, *haec*, *hōc* 'this, this one here' (cf. Ernout—Meillet 1979:293; Sihler 1995:393 **ǵhi-*, **ǵho-*/**ǵheH$_2$-*; Buck 1933: 225; Palmer 1954:255—256) and may also appear in the following particles: Sanskrit *hí* 'for, because, on account of', *ha* particle used to emphasize a preceding word, *gha* particle used to lay stress on a word: 'at least, surely, verily, indeed, especially'; Avestan *zī*; Greek -χι. Cf. Pokorny 1959:417—418.

C. Chukchi-Kamchatkan: This pronominal element appears as *-ɣ-* in Chukchi in the first person singular independent personal pronoun *ɣə-m* 'I' (in predication: *-iɣəm* ~ *-eɣəm*) and the second person singular independent personal pronoun *ɣə-t* 'you' (in predication: *-iɣət* ~ *-eɣət*) (cf. also Fortescue 2005:142—143 and 146—147). While Greenberg attaches a great deal of importance to the parallel between Indo-European and Chukchi (with suggestions of remnants in Uralic as well), it appears to me that we are dealing here with independent developments and not an inherited feature. To be sure, the same principles were at work in each branch, and I agree totally with Greenberg's (2000:81) analysis of the Indo-European form into three parts: **ʔe+g^{h}ŏ+-m* (Greenberg writes **e-+ĝhe* ~ *ĝha+-m*). I base the conclusion that we are dealing here with independent developments in each branch on the fact that three different forms must be reconstructed for Proto-Indo-European, not just one: (1) **ʔe+g^{h}ŏ+-m*, (2) **ʔe+k'ŏ+-m*, and (3) **ʔe+k^{h}ŏ+-m* (in traditional transcription: **e-ĝhŏ-m*, **e-ĝŏ-m*, and **e-k̂ŏ-m*) and that, unlike Indo-European, this pronominal element occurs in both the first and second person forms in Chukchi.

16.13. Deictic particle (A) **ʔa-* (~ **ʔə-*) (distant), (B) **ʔi-* (~ **ʔe-*) (proximate), and (C) **ʔu-* (~ **ʔo-*) (intermediate) (Greenberg: §8. Third-Person I ~ E and §9. Demonstrative A ~ E; Illič-Svityč 1971—1984.I:257—258, no. 121, **ʔa* demonstrative pronoun indicating distant object: 'that', I:270—272, no. 134, **ʔi*/(?)**ʔe* demonstrative pronoun indicating nearby object: 'this'; Nafiqoff 2003:42, 46—47, and 49—50 **ʔi*/(?)**ʔe*; Dolgopolsky 2008, no. 751, **ha* deictic pronominal particle ['ille', distal deixis], no. 753, **h[e]* 'this', no. 754, **[h]i* 'iste' [or 'hic'], no. 755, **[h]u* 'iste')

Greenberg (2000:81) notes that the Common Eurasiatic third person singular pronoun **i-* ~ **e-* originates from a near demonstrative. He also notes (2000:87) that **a-* is a far demonstrative that alternates with **e-*. Greenberg does not posit an intermediate demonstrative. The Dravidian and Southern Cushitic material supports Greenberg's findings on the proximate and distant demonstrative stems and adds evidence for an intermediate demonstrative. In Kartvelian, the distal distribution has been reversed: here, **i-* is the distant stem, and **a-* is the proximate stem.

A. Afrasian: For Proto-Southern Cushitic, Ehret (1980:50) reconstructs the following suffixes: (a) **-i* nearness marker, (b) **-a* farness marker, (c) **-o*

marker of reference (indefinite distance): (a) Iraqw *-i* in *wi*/*ri*/*ti* ‘this’ (m./f.); Burunge *-i* in *ki*/*ti* ‘this’ (m./f.), *-i-* in *tiʔi* ‘here’; Alagwa *-i* in *wi*/*ti* ‘this’ (m./f.); Ma’a *i-* in *ilaʔi* ‘this direction’, *iʔi* ‘here’; (b) Iraqw *-a* in *qa* ‘that’, *da* ‘that aforementioned’; Burunge *-a* in *kaʔa*/*taʔa* ‘that’ (m./f.), *taʔi* ‘there’; Ma’a *-a* in *twaʔi* ‘there’; (c) Iraqw *-o* in *wo*/*ro*/*to* ‘this being talked about’ (m./f./n.); Alagwa *-o* in *qo* ‘that’; K’wadza *-o* in *-uko* masculine gender marker, *-eto*, *-ito* feminine gender marker.

B. Dravidian: Proto-Dravidian (a) **ă̄* distant demonstrative stem (cf. Burrow—Emeneau 1984:1—3, no. 1; Krishnamurti 2003:253—258 and 390 **aH* ‘that’), (b) **ĭ̄* proximate demonstrative stem (cf. Burrow—Emeneau 1984:38—40, no. 410; Krishnamurti 2003:253—258 and 390 **iH* ‘this’), and (c) **ŭ̄* intermediate demonstrative stem (cf. Krishnamurti 2003:253—258 and 391 **uH* ‘yonder, not too distant’; Burrow—Emeneau 1984:54—55, no. 557). Krishnamurti derives these stems from deictic bases and notes that they carry gender and number and are inflected for case. Finally, he notes that time (‘now, then, when’) and place (‘here, there, where’) adverbs are also derived from these deictic bases. Similar usage is found in other Nostratic languages. Examples (this is but a small sampling): (a) Tamil *a* demonstrative base expressing the remoter person or thing; prefixed to nouns to express remoteness; Malayalam *a*, *ā* ‘that, yonder’; Kota *a-* distant from the speaker in space or time; Toda *a-* distant from speaker in space or time; Kannaḍa *a-* remote demonstrative base; Kui *a-* ‘that over there’; Kuwi (adj.) *ā* ‘that most remote’; Kuṛux *a-* ‘that most remote’; (b) Tamil *i* demonstrative base expressing the nearer or proximate person or thing; prefixed to nouns to express nearness; Malayalam *i*, *ī* ‘this’; Kota *i-* demonstrative base expressing nearness to the speaker; Maṇḍa *ī* ‘this’; Toda *i-* demonstrative base expressing nearness to the speaker; Kannaḍa *i-* proximate demonstrative base; (c) Tamil *u* demonstrative base expressing a person, place, or thing occupying an intermediate position, neither far nor near, and meaning yonder or occupying a position near the person or persons spoken to; demonstrative particle before nouns expressing intermediate position or position near the person or persons spoken to; Kannaḍa *u-* base indicating intermediate place, quantity, or time; Kuwi *ū* (adj.) ‘that’ (intermediate).

C. Kartvelian: Proto-Kartvelian **i-* deictic stem (distant) (cf. Klimov 1964:99 and 1998:80), **a-* demonstrative stem (proximate) (cf. Klimov 1964:41 and 1998:2), **e-* pronominal element (cf. Klimov 1964:77 and 1998:45). Extended forms: **e-g-* pronominal stem (cf. Georgian *e-g* ‘this; it, he, she’; Svan [*e-ʒ-*]); **e-š-* pronominal stem (cf. Georgian *ese* ‘so’; Mingrelian *eši* ‘so’; Laz *eše* ‘so, there’; Svan *eš* ‘so’); **i-š-* deictic element (cf. Georgian *is-* ‘that, he’; Mingrelian [*iš-*] in adverbs such as *iš-o*, *viš-o* ‘there’; Laz [*(h)iš-*] in *(h)iš-o* ‘this way, over there’); **a-ma-* ‘that, this’ (cf. Georgian *ama-* ~ *am-* ‘that, this’; Mingrelian *amu-* ‘that, this’; Laz *(h)amu-* ‘that, this’; Svan *am(a)-* ‘that, this’); **a-š-* deictic stem (cf. Georgian *ase* ‘so’; Mingrelian [*aš-*] in *ašo* ‘here’ and *aš(i)* ‘so’; Laz [*(h)aš-*] in *(h)ašo* ‘so’; Svan *aš* ‘so’). There appears to have been a reversal of the Nostratic pattern **ʔa-* (distant) ~ **ʔi-* (proximate) to **a-* (proximate) ~ **i-* (distant) in Kartvelian.

D. Indo-European: demonstrative stem: *ʔe-/*ʔo-, *ʔey-/*ʔoy-/*ʔi- (cf. Latin *is*, *ea*, *id* ‘he, she, it; this or that person or thing’, *idem* ‘the same’; Gothic *is* ‘he’, *it-a* ‘it’; Sanskrit [m.] *ay-ám*, [f.] *iy-ám*, [n.] *id-ám* ‘this’, *átra* ‘there’, *á-taḥ* ‘from there’, *idā́*, *idā́nīm* ‘now’, *ihá* ‘here’, *itthám* ‘thus’; Old Irish *é* ‘he, they’, *ed* ‘it’; Hittite [dat. sg.] *e-di*, *i-di*, *e-da-ni* ‘to or for him, her, it’; etc.), (adverbial particle) *ʔĕ̯-/*ʔŏ̯- ‘near, by, together with’ (cf. Sanskrit *ā́* ‘hither, near to, towards’; Old High German prefix *ā-*; Old Church Slavic prefix *ja-*; Greek prefixes ἐ- and ὀ-) (cf. Brugmann 1904:401, no. 6, and 401—402, no. 10; Szemerényi 1996:206—207; Pokorny 1959:280—281 and 281—286; Burrow 1973:276—278; Beekes 1995:203 and 205; Fortson 2004:129—130 and 2010:134; Watkins 1985:26 and 2000:35—36; Gamkrelidze—Ivanov 1995.I:253). Proto-Indo-European deictic particle *-*i* meaning ‘here and now’ added to verbs to form so-called “primary endings” (cf. Kerns—Schwartz 1972:4; Lundquist—Yates 2018:2140): athematic singular primary endings: first person *-*m-i*, second person *-*s-i*, third person *-*t*^{h}*-i* (cf. Sanskrit *-mi*, *-si*, *-ti*; Hittite *-mi*, *-ši*, *-zi* [< *-*ti*]; Greek -μι, -σι, -τι; Lithuanian *-mi*, *-si*, *-ti*; etc.).

E. Uralic-Yukaghir: Proto-Uralic **e*- demonstrative particle > Finnish *e-* in *että* ‘that’; Estonian *et* ‘that’, *egä*, *iga* ‘every’; Mordvin *e-* in *esë* (iness.) ‘there’, *estä* (elat.) ‘from there’, *eśt'a* ‘so’, *eśt'amo* ‘such’, *ete* ‘this’, *ese* ‘that, that one’, *embɛ* ‘if, when, after’; Zyrian / Komi *e-* in *esy* ‘this, that’; Hungarian *ez* ‘this’, *itt* ‘here’, *innen* ‘from here’, *ide* ‘hither’, *így* ‘so’, *ilyen* ‘such’; Yenisei Samoyed / Enets *eke*, *eko* ‘this, this here’, *eoˀ* ‘hither’ (cf. Collinder 1955:9 and 1977:31; Rédei 1986—1988:67—68; Décsy 1990:98 **e* ‘this’). Yukaghir *a-* distant demonstrative (cf. [Northern / Tundra] *a-n* ‘that’, contrasting with *ten* ‘this’) (cf. Greenberg 2000:89; Nikolaeva 2006:104 and 428).

F. Altaic: Proto-Altaic **i*- deictic stem > (a) Proto-Tungus **i* third person deictic stem > Manchu *i* ‘he, she’, *ineku* ‘the same; this’; Spoken Manchu (Sibo) *ī* ‘he, she’; Jurchen *in* ‘he, she’; Solon *ini* ‘his’; (b) Proto-Mongolian **i-nu*- third person possessive pronoun > Written Mongolian *inu* ‘his’ (originally the genitive of **i* ‘he’, which no longer exists); Khalkha *ń* ‘his’; Buriat *ń* ‘his’; Kalmyk *ń* ‘his’; Moghol *ini* ~ *ni* ~ *ne* ~ *i* ‘his’; Dagur *īn* ‘he; this, that’; (c) Proto-Turkic **ï-na*- ‘that’ > Turkmenian *ïna-ru* ‘that’; Tuva *ïnda* ‘there’, *ïndïγ* ‘such’ (cf. Róna-Tas 1998:74). Cf. Starostin—Dybo—Mudrak 2003:577.

Proto-Altaic **e* ‘this’ (deictic stem) > (a) Proto-Tungus **e* ‘this’ > Evenki *er*, *eri* ‘this’; Lamut / Even *er* ‘this’; Negidal *ey* ‘this’; Manchu *ere* ‘this’; Spoken Manchu (Sibo) *erə* this’; Jurchen *e(r)se* ‘this’; Ulch *ey* ‘this’; Orok *eri* ‘this’; Nanay / Gold *ei* ‘this’; Oroch *ei* ‘this’; Udihe *eyi* ‘this’; Solon *er* ‘this’; (b) Proto-Mongolian **e-ne* ‘this’ (pl. **e-de* ‘these’) > Written Mongolian *ene* ‘this’ (pl. *ede*); Khalkha *ene* ‘this’; Buriat *ene* ‘this’; Kalmyk *enə* ‘this’; Ordos *ene* ‘this’ (pl. *ede*); Moghol *enä* ‘this’; Dagur *ene* ‘this’; Monguor *ne* ‘this’ (cf. Poppe 1955:47, 52, 55, 164, 214—215, 225, and 226). Cf. Starostin—Dybo—Mudrak 2003:447.

Proto-Altaic **a*- ‘that’ (deictic stem) > Proto-Turkic **ạn*- ‘that (oblique cases); here’ > Old Turkic (Orkhon, Old Uighur) (locative) *an-ta* ‘that’, (dative) *aŋ-ar*; Karakhanide Turkic (locative) *an-da* ‘that’, (dative) *oŋ-a*;

Turkmenian *ana* ‘here’; Karaim (locative) *an-da* ‘that’, (dative) *an-ar*; Tatar (locative) *an-da* ‘that’, (dative) *aŋ-a*; Bashkir (locative) *an-ta*, *an-da* ‘that’, (dative) *aŋ-a*; Kirghiz (locative) *an-ta* ‘that’, (dative) *a-(γ)a*; Oyrot (Mountain Altai) (locative) *an-da* ‘that’, (dative) *o-(γ)o*; Tuva (locative) *ïn-da* ‘that’, (dative) *a(ŋ)-a*; Chuvash (locative) *on-da* ‘that’, (dative) *ъʷn-a*; Yakut *ana-rā* ‘here’. Cf. Starostin—Dybo—Mudrak 2003:447. Starostin—Dybo—Mudrak include the Turkic (and Japanese) forms under Proto-Altaic **e*. However, the difference in both form and meaning indicate that two separate stems are involved here. Róna-Tas (1998:74) notes: “Proto-Turkic may nevertheless have had a pronoun for the third person, possibly **a(n)-*, since the oblique stem of *ol* is *an-*; cf. Chuvash *un-*. The fact that Chuvash has a 3p. sg. *-ĕ* < **-i* in certain conjugations shows that Proto-Turkic had a third-person singular pronoun **i-* or **in-*. It developed into a suffix [in Chuvash], but disappeared in other Turkic languages. Note that Proto-Mongolian had 3p. sg. **in-* and 3p. pl. **an-*.”

Proto-Altaic **o* ‘this, that’ (deictic particle) > (a) Proto-Tungus **u-* ‘this, that’ > Manchu *u-ba* ‘here, this place; this’; Spoken Manchu (Sibo) *evā* ‘this’; Udihe *u-ti* ‘that’; (b) Proto-Mongolian **on-* ‘other, different’ > Written Mongolian *ončuγui* ‘peculiar, unusual; specific; separate; special, particular, different; remote, isolated (of place or area); strange’, *ondu* ‘other, another; different(ly); apart, separately’; Khalkha *ondō* ‘other, different’; Buriat *ondō* ‘other, different’; Ordos *ondōn* ‘other, different’; Dagur *enčū* ‘other’; (c) Proto-Turkic **o(l)-* ‘that’ > Old Turkic (Old Uighur) *o-l* ‘that’; Karakhanide Turkic *o-l* ‘that’; Turkish *o* ‘that’; Gagauz *o* ‘that’; Azerbaijani *o* ‘that’; Turkmenian *ol* ‘that’; Uzbek *ụ* ‘that’; Uighur *u* ‘that’; Karaim *o* ‘that’; Tatar *u-l* ‘that’; Bashkir *o-šo*, *u* ‘that’; Kirghiz *o-šo* ‘that’; Kazakh *o-l* ‘that’; Noghay *o-l* ‘that’; Oyrot (Mountain Altai) *o-l* ‘that’; Tuva *ol* ‘that’; Chuvash *vъʷ-l* ‘that’; Yakut *ol* ‘that’ (cf. Róna-Tas 1998:74). Starostin—Dybo—Mudrak 2003:1040.

G. Gilyak / Nivkh: Distant demonstrative (Amur) *a-d′* ‘that, even more distant from the speaker but visible’ (cf. Gruzdeva 1998:26; Greenberg 2000:91).

H. Etruscan: *i-* in *i-ca* ‘this’, *i-n*, *i-nc* ‘it’ (inanimate), *i-ta* ‘this’ (cf. Bonfante—Bonfante 2002:91, 92, and 93).

Sumerian: Adverbial particle *e* ‘hither, here’.

16.14. Deictic particle (A) **k*ʰ*a-* (~ **k*ʰ*ə-*) (proximate), (B) **k*ʰ*u-* (~ **k*ʰ*o-*) (distant), and (C) **k*ʰ*i-* (~ **k*ʰ*e-*) (intermediate) (Greenberg: §10. Demonstrative KU; Dolgopolsky 2008, no. 982, **Ḳ[ü]* demonstrative pronoun [animate ?])

The evidence from all of the Nostratic daughter languages seems to point to the existence of at least two, possibly three, stems here: (A) **k*ʰ*a-* (~ **k*ʰ*ə-*) (proximate), (B) **k*ʰ*u-* (~ **k*ʰ*o-*) (distant), and (?) (C) **k*ʰ*i-* (~ **k*ʰ*e-*) (intermediate). Greenberg (2000:91), however, considers **ku* to have been a near demonstrative. Indeed, there appears to have been some confusion between these stems in the

various daughter languages, which makes it difficult to determine which degree of distance is to be assigned to which stem.

A. Afrasian: Proto-Afrasian **ka-* ~ **ki-* ~ **ku-* demonstrative pronoun stem: Semitic: Aramaic *-χ* (< **-k*) in *dēχ* 'that'; Arabic *-k* in *ðāka*, *ðālika* 'that'; Mehri *-k* in *ðāk* 'that'; Geez / Ethiopic *-(k)ku* an element expressing distance as in *zəkku* 'that'; Gurage *ka* 'that', (Chaha) *kəm* in *kəməkəm* 'such and such', *-x* (< **-k*) in *zax* 'that'; Amharic *-h* (< **-k*) in *zih* 'this'. Cf. Leslau 1979:331, 343 and 1987:271, 635; Barth 1913:80—83; Brockelmann 1908.I:318 and I:323—324. Highland East Cushitic: Burji (m. sg.) *kú* 'this', (m./f. sg./pl.) *káaci* 'that, those', (m./f. pl.) *cí* 'these'; Gedeo / Darasa (m. sg./pl.) *kunni* 'this, these', (m. sg./pl.) *ikki* 'that, those'; Hadiyya (m. sg./pl., f. pl.) *ku(k)* 'this, these', (m. sg./pl., f. pl.) *o(k)* 'that, those'; Kambata (m. sg./pl., f. pl.) *ku* 'this, these'; Sidamo (m. sg.) *kuni* 'this', (m. sg., m./f. pl.) *kuuʔu* 'that, those', (m. pl.) *kuni*, *kuri* 'these'. Cf. Sasse 1982:111; Hudson 1976:255—256 and 1989:150—151, 153. Galla / Oromo (Wellegga) near demonstratives: (subject) *kun(i)*, (base) *kana* 'this'. Proto-Southern Cushitic (m.) **ʔuukaa* 'this', (m. bound) **kaa* 'this' > Iraqw *ka* 'this' (neuter ?); Burunge (m.) *ki* 'this', (m.) *kaʔa* 'that'; K'wadza *-(u)ko* masculine gender marker'; Asa *-(u)k*, *-ok* masculine gender marker; Ma'a *ka* 'this'; Dahalo *ʔuukwa* 'this'. Cf. Ehret 1980:296. Omotic: Aari unaffixed 3rd person pronominal stems (m. sg.) *kí*, (f. sg.) *kó*, (m./f. pl.) *ké* and the deictic determiner *kooné* ~ *kooná* 'this, that; these, those'. This stem may also occur in the Ongota third person singular pronoun stem (m.) *ki* 'he', (f.) *ko* 'she' and third person plural pronoun (focal) *kiʔi-ta* 'they' and the subject and object clitic *kiʔi* 'they' (cf. Fleming 2002b:49, 55, and 59). Ehret (1995:194, no. 309) reconstructs Proto-Afrasian **kaa* 'this' (demonstrative).

B. Kartvelian: Proto-Kartvelian pronoun stem **-k-*: Georgian [*-k-*]; Mingrelian [*-k-*]; Laz [*-k-*]. In the modern Kartvelian languages, this stem is found only in historical derivatives (cf. Klimov 1998:211).

C. Indo-European: Proto-Indo-European near demonstrative **kʰe-*/**kʰo-*, **kʰ(e)i-*, **kʰ(i)yo-* 'this', adverbial particle **kʰe-* 'here' > Hittite (nom. sg.) *ka-a-aš*, (nom.-acc. sg. neuter) *ki-i* 'this, that'; Palaic *ka-* 'this (one)', *ki-i-at* 'here'; Greek **κε-* in κεῖνος 'that'; Latin *ce-* in *ce-do* 'give here!', *-c(e)* in *hi-c*, *sī-c*, *illī-c*, *illū-c*, *tun-c*, *nun-c*, *ec-ce*, *ci-* in *cis*, *citer*, *citrō*, *citrā*; Old Irish *cé* in *bith cé* 'this world'; Gothic *hēr* 'here, hither', *hi-* pronominal stem preserved in the adverbial phrases *himma daga* 'on this day, today', *fram himma* 'from henceforth', *und hina dag* 'to this day', *und hita*, *und hita nu* 'till now, hitherto' and in *hiri* 'come here!', *hidrē* 'hither'; Old Icelandic *hann* 'he'; Old English *hē* 'he', *hīe* 'they', *hider* 'hither', *hēr* 'here'; Lithuanian *šìs* 'this'; Old Church Slavic *sъ* 'this'. (cf. Pokorny 1959:609—610; Walde 1927—1932.I: 452—454; Mann 1984—1987:606, 617, 619, 620, 621, 622; Watkins 1985:32 and 2000:43; Brugmann 1904:401, nos. 4 and 5; Lehmann 1986:182 and 182—183; Beekes 1995:202 **ḱi-* 'here'; Puhvel 1984— .4:3—12; Meillet 1964:326; Fortson 2004:130 and 2010:144; Kloekhorst 2008b:425—427).

D. Altaic: Proto-Altaic *$k^h o$- (~ *k*-) ‘this’ > (a) Proto-Mongolian *$kü$ deictic particle > Written Mongolian *ene kü* ‘exactly this’, *tere kü* ‘exactly that’; Khalkha *$\chi\bar{u}$*; Ordos *$k\bar{u}$*; Dagur *ke*, *$k\bar{e}$*; (b) Proto-Turkic *$kö$ ‘this’ > Salar *ku* ‘this’; Sary-Uighur *gu*, *go* ‘this’; Chuvash *ko*, *kъv* ‘this’. Starostin—Dybo—Mudrak 2003:709 *ko (~ *k'-) ‘this’. Greenberg (2000:92—93) describes “a widespread Altaic suffix *-ki*, with a demonstrative and revitalizing function, which may belong here”. As evidence, he cites the Turkic suffix *-ki* used to form possessive pronouns. It also occurs after the locative of a noun. Both uses are also found in Mongolian (cf. *ende-ki* ‘being here, belonging to this place’). In Tungus, *-*ki* is suffixed to possessives to substantivize them. The locative construction found in Turkic and Mongolian appears to be absent from Tungus, however. Greenberg also notes that “occasional forms in *ku* occur in all branches of Altaic”.

E. Gilyak / Nivkh: (Amur) *kud′* ‘that, absent in the present situation, formerly referred to in the previous discourse’ (cf. Gruzdeva 1998:26).

F. Etruscan: Note the demonstratives (archaic) *ika* ‘this’, (later) *eca*, *ca*.

Sumerian: *ki* ‘there, where’.

16.15. Deictic particle (A) *$t^h a$- (~ *$t^h ə$-) (proximate), (B) *$t^h u$- (~ *$t^h o$-) (distant), and (C) *$t^h i$- (~ *$t^h e$-) (intermediate) (Greenberg: §11. Demonstrative T; Nafiqoff 2003:51 *$ṭa$; Dolgopolsky 2008, no. 2310, *$ṭä$ demonstrative pronoun of non-active [animate] objects [without distance opposition (proximate ↔ intermediate ↔ distal)])

It seems that three separate stems are to be reconstructed here, indicating three degrees of distance: (A) *$t^h a$- (~ *$t^h ə$-) (proximate), (B) *$t^h u$- (~ *$t^h o$-) (distant), and (C) *$t^h i$- (~ *$t^h e$-) (intermediate). As in (A) *$k^h a$- (~ *$k^h ə$-) (proximate), (B) *$k^h u$- (~ *$k^h o$-) (distant), and (C) *$k^h i$- (~ *$k^h e$-) (intermediate), discussed above, there appears to have been some confusion between these stems in the various daughter languages, which makes it difficult to determine which degree of distance is to be assigned to which stem.

A. Afrasian: Proto-Afrasian *ta- (~ *tu- ~ *ti-) demonstrative stem > Proto-Semitic *$tā$-/*$t\check{ī}$- demonstrative stem > Arabic (m.) $t\check{ī}$, (f.) $tā$ ‘this’; Tigre (m.) $tū$, (f.) $tā$ ‘this’. Egyptian (f. sg. dem. and def. article) *tꜣ* ‘this, the’, (f. sg. dem. adj.) *tn* ‘this’; Coptic *t-* [ⲧ-], *te-* [ⲧⲉ-] feminine singular definite article. Berber: Tuareg *ta* feminine singular demonstrative stem: ‘this one’ (pl. *ti*). Proto-East Cushitic *ta, (subj.) *tu/*ti feminine demonstrative pronoun stem > Burji (dem. f.) *ta*, (subj.) *ci* ‘this’; Somali (dem. f.) *ta*, (subj.) *tu*; Rendille *ti* feminine gender marker and connector; Oromo / Galla *ta-*, (subj.) *tu-*; Sidamo *-ta*, (subj.) *-ti* feminine article; Kambata (f. acc. sg. dem. det.) *ta* ‘this’; Hadiyya (f. acc. sg. dem. det.) *ta* ‘this’. Proto-Southern Cushitic (f. bound dem. stem) *ta ‘this, that’ > Burunge *ti* ‘this’, *taʔa* (f.) ‘that’; Iraqw *ti* ‘this’; K’wadza *-(i)to*, *-(e)to*

feminine gender marker; Asa *-(i)t(o)*, *-(e)t(o)* feminine gender marker; Ma'a *-eta* suffix on feminine nouns; Dahalo *t̲á-* in *t̲áʾini* (f.) 'they'.

B. Dravidian: Proto-Dravidian **tă̄n-* reflexive pronoun singular, **tă̄m-* reflexive pronoun plural > Tamil *tāṉ* 'oneself' (obl. *taṉ-*; before vowels *taṉṉ-*), *tām* (obl. *tam-*; before vowels *tamm-*) 'they, themselves; you'; Malayalam *tān* 'self, oneself', *tām* (obl. *tam-*, *tamm-*) 'they, themselves; you'; Kota *ta·n* 'oneself', *ta·m* (obl. *tam-*) 'themselves'; Toda *to·n* 'oneself', *tam* (obl. *tam-*) 'themselves'; Kannaḍa *tān* 'he, she, it' (in the reflexive or reciprocal sense), *tām* (obl. *tam-*), *tāvu* (obl. *tav-*) 'they, themselves; you'; Koḍagu *ta·nï* 'oneself', *taŋga* (obl. *taŋga-*) 'themselves'; Telugu *tānu* 'oneself; he or himself; she or herself', *tāmu* (obl. *tam-*, *tamm-*), *tamaru*, *tāru* 'they, themselves; you'; Naikṛi *tām* 'they, themselves'; Parji *tān* 'self, oneself', *tām* (obl. *tam-*) 'they, themselves'; Gadba (Ollari) *tān* (obl. *tan-*) 'self, oneself', *tām* (obl. *tam-*) 'they, themselves'; Pengo *tān* 'he, himself'; Kuṛux *tān* reflexive pronoun of the third person: 'himself', *tām-* (obl. *tam-*) 'they, themselves'; Malto *tán*, *táni* 'himself, herself, itself', *tám*, *támi* (obl. *tam-*) 'they, themselves'; Brahui *tēn* 'self, myself, thyself, himself, ourselves, etc.' Cf. Krishnamurti 2003:252—253; Burrow—Emeneau 1984:275, no. 3162, and 278, no. 3196.

C. Indo-European: Proto-Indo-European **tʰo-* 'that', also **tʰyo-* (< **tʰi-o-*) > Sanskrit *tád* 'this, that'; Greek τό 'this, that'; Gothic *þata* 'that'; Old Icelandic *þat* 'that, it'; Old English *þæt* 'that'; Lithuanian *tàs* 'this, that'; Tocharian A *täm* 'this', B *te* 'this one, it'; Hieroglyphic Luwian *tas* 'this'; Hittite *ta* sentence connective. This stem is joined in a suppletive alternation with **so-* 'this'. It is also used as a third person verb ending (primary) **-tʰi*, (secondary) **-tʰ* > Hittite (primary) *-zi* (< **-ti*), (secondary) *-t*; Sanskrit (primary) *-ti*, (secondary) *-t*; Avestan (primary) *-ti*, (secondary) *-ṯ*; Greek (primary) -τι; Gothic (primary) *-þ*; Latin (primary/secondary) *-t*; Lithuanian (primary) *-ti*; Russian Church Slavic (primary) *-тъ*. Cf. Pokorny 1959:1086—1087; Burrow 1973:269—272 and 306—311; Brugmann 1904:399—401 and 590—591; Beekes 1995:202 and 232; Szemerényi 1996:204—206 and 233—235; Meillet 1964:228 and 326; Fortson 2004:129—130 and 2010:144.

D. Uralic-Yukaghir: Proto-Uralic (demonstrative pronoun stem) **ta*/**tä* 'this' > Finnish *tämä/tä-* 'this'; (?) Estonian *tema*, *temä* 'he, she, it'; Lapp / Saami *dat* ~ *da-* 'this', *deikĕ* (< **dekki*) 'hither'; Mordvin (Erza) *te*, (Moksha) *tɛ* 'this', (Erza) *tesë*, (Moksha) *t'asa* 'here', (Erza) *tite*, *teke*, (Moksha) *titɛ*, *t'aka* '(just) this'; Cheremis / Mari (West) *ti*, (East) *tə*, *tõ* 'this'; (?) Votyak / Udmurt *ta* 'this'; (?) Zyrian / Komi *ta* 'this'; Vogul / Mansi *te*, *ti*, *tə* 'this', *tet*, *tit*, *tət* 'here'; Ostyak / Xanty *temi*, *tə-* 'this'; Yurak Samoyed / Nenets *tæmʔ* 'this', (pl.) *teewʔ* 'these'; Selkup Samoyed *tam*, *tau*, *tap* 'this', *tedaʔ* 'now', *tii*, *teŋa*, *teka* 'hither'; Kamassian *teeji* 'hither'. Cf. Rédei 1986—1988:505 **ta*; Collinder 1955:62 and 1977:79; Décsy 1990:108 **ta*/**tä* 'that, this'. Yukaghir (Southern / Kolyma) *tiŋ* 'this', *ti:* 'here', *ti:-ta:* 'here and there'. Proto-Uralic (demonstrative pronoun stem) **to-* 'that' > Finnish *tuo* 'that, yonder'; Lapp / Saami *duot-* ~ *duo-* 'that (one) over there, that … over there, that'; Mordvin *tona*, *to-* 'that'; Cheremis / Mari (East) *tu* 'that'; Vogul / Mansi *ton*, *to-* 'that';

Votyak / Udmurt *tu* ‘that’; Zyrian / Komi *ty* ‘that’; Ostyak / Xanty *tŏmi*, *tomi*, *tŏm*, *tŏ-* ‘that’; Hungarian *tova* ‘away’, *túl* ‘beyond, on the further side; exceedingly, too’; Yurak Samoyed / Nenets *taaky* ‘that, yonder’, *taaj* ‘there’; Yenisei Samoyed / Enets *tohonoo* ‘that (one) there’; Selkup Samoyed *to* ‘this’. Cf. Collinder 1955:64, 1965:146, and 1977:81; Rédei 1986—1988:526—528 **to*; Décsy 1990:109 **to* ‘those’; Joki 1973:330—331; Raun 1988b:562. Ob-Ugric and Samoyed third person singular possessive suffix **-t*. Cf. also Abondolo 1998a:25. Yukaghir (Southern / Kolyma) *taŋ* ‘that’, *tada* ‘there’, *ta:t* ‘so, then’, *tude-* ‘he, she, it’ (cf. Nikolaeva 2006:423—424 and 438).

E. Altaic: Proto-Altaic *t^ha (*t^he) ‘that’ > (a) Proto-Tungus **ta-* ‘that’ > Manchu *tere* ‘that’; Solon *tari* ‘that’; Evenki *tar*, *tari* ‘that’; Lamut / Even *tar* ‘that’; Negidal *tay* ‘that’; Orok *tari* ‘that’; Nanay / Gold *taya* ‘that’; Udihe *tei*, *teyi* ‘that’; Oroch *tī*, *tei* ‘that’; Solon *tayā*, *tari* ‘that’; (b) Proto-Mongolian (sg.) **te*, **te-r-e* ‘that’ > Written Mongolian (sg.) *tere* ‘that’, (pl.) *tede* ‘those’; Dagur (sg.) *tere* ‘that’, (pl.) *tede* ‘those’; Moghol *tĕ* ‘that’; Ordos (sg.) *tere* ‘that’, (pl.) *tede* ‘those’; Khalkha (sg.) *terə* ‘that’, (pl.) *tèddə* ‘those’; Monguor (sg.) *te* ‘that’; Moghol (sg.) *te* ‘that’; Buriat (sg.) *tere* ‘that’, (pl.) *tede* ‘those’ (cf. Poppe 1955:225, 226, 227, and 228); (c) Proto-Turkic **ti(kü)-* ‘that’ > Gagauz *te bu* ‘this here’, *te o* ‘that there’; Tatar *tĕgĕ* ‘that’; Kirghiz *tigi* ‘that’; Kazakh (dialectal) *tigi* ‘that’; Yakut *i-ti* ‘that’ (pl. *itiler* ‘those’). Starostin—Dybo—Mudrak 2003:1389 **tʹa* (**tʹe*) ‘that’.

F. Gilyak / Nivkh: (Amur) *tyd′* ‘this, the nearest to the speaker, visible and available in the present situation’, *tuŋs* ‘so much (persons or objects close to the speaker)’ (cf. Gruzdeva 1998:26).

G. Etruscan: Note the demonstratives *ita*, *ta* ‘this’ and the adverb *θar* ‘there, thither’.

16.16. Deictic particle **ša-* (~ **šə-*) ‘this one here, that one there’ (Greenberg: §12. Demon-strative S; Nafiqoff 2003:53 **sV*)

A. Afrasian: Chadic: Ngizim near demonstrative pronoun *sáu* ‘this one’, *sáu ... sáu* ‘this one … that one’; Hausa *sà* ‘his, him’.

B. Kartvelian: Proto-Kartvelian **-š-* pronoun stem > Georgian [*-s-*]; Mingrelian [*-š-*]; Laz [*-š-*]; Svan [*-š-*]. Cf. Klimov 1964:173 and 1998:178; Fähnrich—Sardshweladse 1995:310—311; Fähnrich 2007:378.

C. Indo-European: Proto-Indo-European **so-*, (f.) **seA* [**saA*] (> **sā*), also **syo-* (< **si-o-*), demonstrative pronoun stem: ‘this, that’ > Sanskrit *sá-ḥ*, (f. sg.) *sā* (also *sī*), *syá-ḥ* demonstrative pronoun; Avestan *ha-* demonstrative pronoun stem; Greek ὁ, (f. sg.) ἡ demonstrative pronoun and definite article; Old Latin (m. sg.) *sum* ‘him’, (f. sg.) *sam* ‘her’, (m. pl.) *sōs*, (f. pl.) *sās* ‘them’; Gothic *sa*, (f.) *sō* ‘this, that; he, she’; Old Icelandic *sá*, *sú* ‘that’; Old English *se* ‘that one, he’, (f.) *sēo* ‘she’; Old High German *si*, *sī* ‘she’; Tocharian A (m.) *sa-*, (f.) *sā-*, B (m.) *se(-)*, (f.) *sā(-)* demonstrative pronoun; Hittite *ša* connective particle, *-še* third person singular enclitic pronoun. Cf. Pokorny 1959:978—979; Walde

1927—1932.II:509; Mann 1984—1987:1137 **sī-* (**sīm*) ‘he, she, it’, 1142—1143 **sį̄ā* (**sį̄ə*) ‘she, it’, 1143—1144 **sį̄os*, **sį̄ā* ‘he; she; this, it’, 1250 **sos*, (f.) **sā* ‘this; he, she’; Watkins 1985:62 and 2000:81; Gamkrelidze—Ivanov 1984.I:384 and 1995.I:336. (?) Proto-Indo-European **-s-* in (m.) **ʔey-s-os*, (f.) **ʔey-s-eA* [*-aA*] (> *-ā*), **ʔey-s-yos* compound demonstrative pronoun: ‘this’ > Sanskrit *eṣá-ḥ* (f. *eṣā́*) ‘this’; Avestan *aēša-* (f. *aēšā*) ‘this’; Oscan *eíseís* ‘he’; Umbrian *erec*, *erek*, *ere*, *eřek*, *erse* ‘he, it’. Note: the **-s-* element could be from the Proto-Nostratic third person anaphoric stem **si-* (~ **se-*) instead (see below). Cf. Pokorny 1959:281—283; Walde 1927—1932.I:96—98; Mann 1984—1987:235 **eisį̄os* (**eiso-*, **eito-*) a compound pronoun; Mayrhofer 1956—1980.I:129. This stem is joined in a suppletive alternation with **t^ho-* ‘that’ (cf. Watkins 1998:66).

D. Uralic: Proto-Finno-Ugrian **s[ä]* ‘he, she, it’ > Finnish *hän* (< **sän*) ‘he, she’; Lapp / Saami *son* ‘he, she’; Mordvin *son* ‘he, she’; Votyak / Udmurt *so* ‘that, yonder; he, she, it’; Zyrian / Komi *sy* ‘he, she, it’, *sija* ‘he, she, it; that, yonder’; Vogul / Mansi *täu* ‘he, she’; Ostyak / Xanty (Vasyugan) *jŏh* ‘he, she’; Hungarian *ő* ‘he, she, it’. Cf. Collinder 1955:80—81 and 1977:97; Rédei 1986—1988:453—454; Décsy 1990:107; Hajdú 1972:40 Proto-Uralic **se*; Abondolo 1998a:25.

Sumerian: *še* deictic element, exact meaning unknown. *še* is translated by the Akkadian demonstrative pronoun *animmamû*. Cf. Thomsen 1987:81.

16.17. Anaphoric pronoun stem **si-* (~ **se-*) (Dolgopolsky 2008, no. 2006, **sE* ‘he/she’; Greenberg: §12. Demonstrative S)

This is an old anaphoric pronoun distinct from Proto-Nostratic **ša-* (~ **šə-*) ‘this one here’.

A. Afrasian: Proto-Afrasian **si-* third person pronoun stem, **-s(i)* third person suffix > Egyptian *-s*, *-sy* third person singular suffix; dependent pronouns: *sw* ‘he, him, it’, *sy* ‘she, her, it’, *sn* ‘they, them’, *st* old form of the dependent pronoun third singular feminine, which has been specialized for certain particular uses, mainly in place of the third plural ‘they, them’ or of the neuter ‘it’. Cf. Gardiner 1957:45, §43, 46, §44, and 98, §124; Hannig 1995:647, 674, 712, and 777; Faulkner 1962:205, 211, 215, 230, and 252. Berber: Tamazight third person indirect pronouns: (singular after preposition and possessive with kinship) *s*, *as*, (possessive sg.) *-nnəs* or *ns*; (m. pl.) *sən*, *-sən*, *asən*, (f. pl.) *sənṯ*, *-sənṯ*, *asənṯ*, (possessive m. pl.) *-nsən*, (possessive f. pl.) *-nsənṯ*. Cf. Penchoen 1973:26—27. Chadic: Ngizim demonstratives (previous reference): (deictic predicator) *sə́nà* ‘here/there (it) is, here/there they are (pointing out or offering)’, (pronoun) *sə́nú* ‘this one, that one; this, that (thing or event being pointed out or in question)’; Hausa *šii* ‘he’, (direct object) *ši* ‘him’. Proto-East Cushitic **ʔu-s-uu* ‘he’ > Burji *ís-i* third singular masculine personal pronoun

abs. (= obj.) ‘him’; Gedeo / Darasa *isi* third singular masculine nominative pronoun ‘he’; Kambata *isi* third singular masculine nominative pronoun ‘he’; Sidamo *isi* third singular masculine nominative pronoun ‘he’. Proto-East Cushitic **ʔi-š-ii* ‘she’ > Burji *íš-ée* third singular feminine personal pronoun abs. (= obj.) ‘her’; Gedeo / Darasa *ise* third singular feminine nominative pronoun ‘she’; Hadiyya *isi* third singular feminine nominative pronoun ‘she’; Kambata *ise* third singular feminine nominative pronoun ‘she’; Sidamo *ise* third singular feminine nominative pronoun ‘she’. Cf. Sasse 1982:106 and 107; Hudson 1989:77 and 132. Highland East Cushitic: Kambata *-si* third singular possessive pronoun (m.): ‘his’, *-se* third singular possessive pronoun (f.): ‘her’; Sidamo *-si* third singular possessive pronoun (m.): ‘his’, *-se* third singular possessive pronoun (f.): ‘her’. Cf. Hudson 1989:80. Proto-Southern Cushitic **ʔi-si-* ‘she’ > Iraqw, Burunge, Alagwa *-s* in *-os* ‘his, her, its’. Proto-Southern Cushitic **-si* (bound) ‘her’ > Dahalo *ʔíði* ‘she’, *-ði* ‘her’. Proto-Southern Cushitic **ʔu-su-* ‘he’ > Iraqw, Burunge, Alagwa *-s* in *-os* ‘his, her, its’. Proto-Southern Cushitic **-su* (bound) ‘his’ > Ma’a *-ʔu* in *ku-ʔu* ‘his, her, its’; Dahalo *ʔúðu* ‘he’, *-ðu* ‘his’. Cf. Ehret 1980:290 and 295. Omotic: Zayse bound third person singular subject pronouns: (m.) *-s*, (f.) *-is*, third person singular independent pronouns: (subject m.) *ʔé-s-í*, (subject f.) *ʔí-s-í*, (direct object complement m.) *ʔé-s-a*, (direct object complement f.) *ʔí-s-a*, (postpositional complement m.) *ʔé-s-u (-ro)*, (postpositional complement f.) *ʔí-s-u(-ro)*, (copular complement m.) *ʔé-s-te*, (copular complement f.) *ʔí-s-te*; Gamo *sekki* ‘that, those’, third person singular subject markers (affirmative): (m.) *-es*, (f.) *-us*. Ehret (1995:156, no. 210) reconstructs Proto-Afrasian **su*, **usu* ‘they’.

B. Elamite: Third singular personal suffix *-š* (< **-si* ?).

C. Kartvelian: Proto-Kartvelian **-s* verb suffix used to mark the third person singular (subjective conjugation) > Georgian *-s*; Mingrelian *-s*; Laz *-s*; Svan *-s*. Cf. Fähnrich 1994:241 and 2007:357—358; Klimov 1964:160; Fähnrich—Sardshweladse 1995:292.

D. Indo-European: Proto-Indo-European **-s* third person singular verb ending > Hittite *ḫi*-conjugation third singular preterit ending *-š* (cf. Sturtevant 1951:144, §270a; J. Friedrich 1960:76—79); Sanskrit third singular root aorist optative ending *-s* in, for example, *bhū-yā́-s* (cf. Burrow 1973:352); Tocharian A third singular verb ending *-ṣ* (< **-se*) in, for example, *pälkäṣ* ‘shines’ (cf. Adams 1988:56, §4.212). According to Watkins (1962), it was this suffix that gave rise to the sigmatic aorist in Indo-European. Proto-Indo-European **-s-* in (m.) **ʔey-s-os*, (f.) **ʔey-s-eA* [**ʔey-s-aA*] (> **eysā*), **ʔey-s-yos* a compound demonstrative pronoun: ‘this’ > Sanskrit *eṣá-ḥ* (f. *eṣā́*) ‘this’; Avestan *aēša-* (f. *aēšā*) ‘this’; Oscan *eíseís* ‘he’; Umbrian *erec*, *erek*, *ere*, *eřek*, *erse* ‘he, it’. Note: the **-s-* element could be from the Proto-Indo-European demonstrative stem **so-* ‘this, that’ (< Proto-Nostratic **ša-* [~ **šə-*] ‘this, that’) instead. Cf. Pokorny 1959:281—283; Walde 1927—1932.I:96—98; Mann 1984—1987: 235 **eisi̯os* (**eiso-*, **eito-*) a compound pronoun; Mayrhofer 1956—1980.I: 129.

E Uralic: Proto-Uralic *-*se* third singular possessive suffix/third person verb suffix (determinative conjugation). Cf. Abondolo 1998a:29; Hajdú 1972:40 and 43—44; Raun 1988b:564.

F. Altaic: Proto-Turkic *-*(s)i(n)* ~ *-*(s)ï(n)* third person possessive suffix > Turkish -*(s)I(n)*; Azerbaijani -*(s)I*; Turkmenian -*(s)I*; Tatar -*(s)E*; Kazakh -*(s)I*; Kirghiz -*(s)I*; Uighur -*(s)I*. Cf. Johanson—Csató 1998; Starostin—Dybo—Mudrak 2003:1320—1321 **sV́* (~ **š*-) 'this, that' (3rd person pronoun).

16.18. Deictic particle **na* (~ **nə*), **ni* (~ **ne*) (not in Greenberg 2000; Nafiqoff 2003:50—51 **NA*; Illič-Svityč 1971—1984.II:93—94, no. 332, **NA* demonstrative pronoun)

A. Afrasian: Proto-Semitic demonstrative stem/deictic particle **na*/**-n* (cf. Akkadian *annū* 'this'; Sabaean -*n* definite article; Hebrew -*n* deictic element). Egyptian (dem. neuter and pl.) *nꜣ* 'this, these', (dem. pronoun) *nw* 'this, these'; Coptic *n*- [ⲛ-], *nen*- [ⲛⲉⲛ-] plural of definite article, *nai* [ⲛⲁⲓ] 'these', *nē* [ⲛⲏ] 'those'. Berber: Kabyle -*nni* 'this, that; these, those', -*inna*/-*yinna* 'that, those' (a person or thing at a distance but usually within sight). According to Sasse (1984:123, fn. 3), there is evidence for the reconstruction of a demonstrative stem **n*- in East Cushitic: Afar **n-a*, Saho **n-i/u*. Sasse further notes that this stem is attested in combination with *k*/*t* demonstratives in Galla / Oromo and Saho-Afar. Proto-Agaw **-n*- in **ʔə-n*- 'this' > Bilin *ʔəna* 'this', *ʔən* 'the'; Xamtanga (suffix) (m.) -*in* 'that' (cf. Appleyard 2006:136).

B. Kartvelian: Found in verb endings in Kartvelian. Proto-Kartvelian third person singular present iterative (subjective conjugation) **-n* > Old Georgian -*n*; Mingrelian -*n*; Laz -*n* (cf. Klimov 1964:144—145; Fähnrich—Sardshweladse 1995:258; Fähnrich 1994:85, 240, and 2007:310—311). Proto-Kartvelian third person plural present (subjective conjugation) **-en* > Georgian -*en*, -*n*; Mingrelian -*an*, -*a*, -*n*; Laz -*an*, -*n* (cf. Klimov 1964:79; Fähnrich 1994:85, 240, and 2007:148—149; Fähnrich—Sardshweladse 1995:123).

C. Indo-European: Proto-Indo-European demonstrative stem **ne*-, **no*-; **ʔe-no*-, **ʔo-no*- > Sanskrit (instr.) *anéna*, *anáyā* 'this, these'; Avestan *ana*- 'this'; Greek ἔνη 'the last day of the month'; Latin (conj.) *enim* 'indeed, truly, certainly'; Lithuanian *añs*, *anàs* 'that, that one'; Old Church Slavic *onъ* 'that, he'; Hittite *an-ni-iš* 'that, yonder'; Armenian *na* 'that; he, she, it; him, her' (cf. Brugmann 1904:401; Burrow 1973:277; Mayrhofer 1956—1980.I:32; Pokorny 1959:319—321; Walde 1927—1932.II:336—339; Puhvel 1984— .1/2:51—55; Kloekhorst 2008b:173—174). This stem may occur in the third plural verb ending **-n* as well. This was later extended by **-t*^{h} to form a new third plural ending **-nt*^{h}. Later still, this was further extended by a deictic **-i* to form the so-called "primary" third plural ending **-nt*^{h}*i* (see below for details).

D. Uralic: Proto-Uralic **nä* (~ **ne* ~ ? **ni*) 'this; this one' > Finnish *nämä*/*nä*- (pl. of *tämä*/*tä*-) 'these', *ne*/*ni*- (pl. of *se*) 'these, those', *näim* 'so, like this', *niin* 'so, thus'; Lapp / Saami *navt*, *na* 'like this, in the same way as this'; Mordvin

ne (pl. of *te* ‘this’ and *se* ‘that’) ‘these, those’; Zyrian / Komi *na*, *najõ* ‘she’; Selkup Samoyed *na* ‘that’, *nyy* ‘thither’ (cf. Collinder 1955:38 and 1977:57; Rédei 1986—1988:300—301; Décsy 1990:103).

E. Altaic: Proto-Tungus third person possessive suffix *-*n* (cf. Sinor 1988:725) > Evenki -*n* (-*in* after consonants); Lamut / Even -*n* (-*an* after consonants); Udihe -*ni*; etc. Cf. Fuchs—Lopatin—Menges—Sinor 1968.

Sumerian: *na*, *ne* ‘this’; *ane*, *ene* ‘he, she’, -*ani* (-*ni* after vowels) ‘his, her’.

16.19. Deictic particle *$t^{y}{}^{h}a$- (~ *$t^{y}{}^{h}ə$-) ‘that over there, that yonder (not very far)’ (not in Greenberg 2000)

A. Afrasian: Proto-Semitic *$t^{y}a$- ‘that over there, that yonder’ > Arabic *tamma* ‘there, yonder’, *tumma* ‘then, thereupon; furthermore, moreover; and again, and once more’, *tammata* ‘there, there is’; Hebrew *šām* ‘there, thither’; Imperial Aramaic *tmh* ‘there’; Biblical Aramaic *tammā* ‘there’; Phoenician *šm* ‘there’; Ugaritic *tm* ‘there’. Cf. Klein 1987:664.

B. Altaic: Proto-Altaic *$č^{h}a$- ‘that over there, that yonder (not very far)’ > (a) Proto-Tungus **čā*- ‘that, further (not very far)’ > Manchu *ča*- ‘over there (not very far)’: *čala* ‘over there, on the other side; previously, before’, *čargi* ‘there, over there, that side, beyond; formerly’, *časi* ‘in that direction, thither, there’; Evenki *čā*- ‘that, further (not very far)’; Lamut / Even *čā*- ‘that, further (not very far)’; Negidal *čā*- ‘that, further (not very far)’; Ulch *ča*- ‘that, further (not very far)’; Orok *čō*- ‘that, further (not very far)’; Nanay / Gold *ča*- ‘that, further (not very far)’; Oroch *čā*- ‘that, further (not very far)’; Udihe *ča*- ‘that, further (not very far)’; Solon *sā*- ‘that, further (not very far)’; (b) Proto-Mongolian *čа- ‘that, beyond’ > Mongolian *ča*- in: *čadu*, *čaγadu* ‘situated on the other or opposite side; beyond’, *čaγaduki* ‘lying opposite, situated on the other side; situated beyond’, *čaγan-a*, *čiγan-a* ‘farther, beyond, behind, yonder’, *čaγaγur* ‘along or on the other side; farther, beyond’, *čaγanaχan* ‘a little further or beyond’; Khalkha *cāna* ‘that, beyond’; Buriat *sā*- ‘that, beyond’; Kalmyk *cā*- ‘that, beyond’; Ordos *čāna* ‘that, beyond’; Dagur *čā-š* ‘that, beyond’, *čāši* ‘thither’; Monguor *ćaɢšə*, *taɢšə* ‘that, beyond’. Cf. Starostin—Dybo—Mudrak 2003:406 *č'a ‘that, beyond (not very far)’; Poppe 1960:26 and 139; Street 1974:10 *čagā ‘there, further away’.

C. Eskimo: Proto-Eskimo demonstrative stem *cam- ‘down below, down-slope (not visible)’: Alutiiq Alaskan Yupik *camna*; Central Alaskan Yupik *camna*; Naukan Siberian Yupik *samna*; Central Siberian Yupik *saamna*; Sirenik *samna*; Seward Peninsula Inuit *samna*; North Alaskan Inuit *samna*; Western Canadian Inuit *hamna*; Eastern Canadian Inuit *sanna*; Greenlandic Inuit *sanna*. Note: all of the preceding forms are cited in the absolutive singular. Cf. Fortescue—Jacobson—Kaplan 1994:458.

II. DUAL AND PLURAL MARKERS

16.20. Dual **kʰi(-nV)* (Greenberg: §14. Dual KI[N]; Dolgopolsky 2008, no. 1902, **q̇V* particle of collectivity [(in descendant languages) → a marker of plurality]; Fortescue 1998:96—123)

Greenberg (2000:101—106) reconstructs a Eurasiatic dual marker *KI(N). The evidence he adduces for this formant is spotty. Nonetheless, I believe that he may ultimately be right. It looks like we are dealing here with an archaic word for the number 'two', which shows up in Egyptian as 'other, another' and which is preserved in relic forms here and there in other Nostratic daughter languages as a dual formant.

A. Afrasian: Note Egyptian (m.) *ky*, *kỉ*, *kỉỉ*, (f.) *kt* (*kỉtỉ*) 'other, another'; Coptic *ke* [**ϰє**] 'another (one), (the) other (one); other, different'. Cf. Hannig 1995:878—879; Gardiner 1957:78, §98, and 597; Vycichl 1984:70; Černý 1976:51.

B. Indo-European: Mann (1984—1987:618) posits a Proto-Indo-European **k̂in-*, but he does not assign a meaning. He bases this reconstruction on the following forms from the daughter languages: Armenian *mia-sin* 'together'; Old Church Slavic *sǫ-sьnъ* 'mutual', *pri-sьnъ* 'akin'. The underlying sense seems to have been togetherness or complementarity, which may be derived from an original meaning 'pair, set of two' or the like. Though speculative, there is nothing unreasonable in this proposal.

   At the very end of the discussion of Dual *KI(N), Greenberg (2000:106) briefly mentions the Armenian plural ending *-kʰ* (= *-k'*), which, as he notes, has always been enigmatic. I would remove Armenian from this section and put it in §18. Plural KU. The Armenian ending *-kʰ* has no known parallels in other Indo-European languages and is usually considered to be a development specific to Armenian, without clear explanation (cf., for example, Godel 1975:102, §5.22, and Rüdiger Schmitt 1981:111—112). To be sure, a suffix **-kʰ(o)-* is well represented in other Indo-European daughter languages — it is found, for instance, in Latin *senex* 'old man', Greek μεῖραξ 'young man, lad', and Sanskrit *sanaká-ḥ* 'old' —, but it usually does not change the meaning except in a few cases where it seems to add a diminutive sense (as in Sanskrit *putraká-ḥ* 'little son'). Nothing would lead one to think that this ending could have been the source of the Armenian plural ending *-kʰ*. At the same time, I find it hard to believe that a Proto-Eurasiatic plural marker **-kʰ(V)* could have been preserved in Armenian and have left absolutely no traces in the other Indo-European daughter languages — and yet, there it is!

C. Uralic: Greenberg (2000:102—103) mentions possible related forms in Uralic: Proto-Uralic dual **-ka* ~ **-kä* + **-n* or **-nʸ* (cf. Collinder 1960:302—303; Décsy 1990:73). This is identical in form to the plural ending of the personal/possessive inflection. However, we would expect Proto-Uralic **-ki* ~ **-ke* + **-n* or **-nʸ*, with **-i* ~ **-e* vocalism, if the Uralic forms had indeed been related to the others discussed by Greenberg instead of the vowels reconstructed by

Collinder (and others). Therefore, if the traditional reconstruction is correct, the inclusion of the Uralic material here is suspect. In fairness, Greenberg (2000:102) does propose that "*k* was originally a dual and was in fact followed by a vowel *i* that was often lost", and Greenberg's case is strengthened by the Selkup Samoyed dual marker (used with both nouns and verbs) *-qi*, *-qɨ* (Collinder 1960:302 writes *-qy*). See also Aikio to appear, p. 35. Yukaghir (Northern / Tundra) *ki* 'two', *kijuod'e* 'twins' (cf. Nikolaeva 2006:209).

D. Gilyak / Nivkh: Greenberg (2000:103) derives the *-gi* extension found in the Amur first person dual personal pronoun *me-gi* 'we two' from **-ki(n)* by assuming derivation from **men-gi(n)* (or **meŋ-gi(n)*), with **-g-* through voicing of **-k-*. With loss of **-n-*, we arrive at the attested form: **men-ki(n)* > (with voicing of *k* to *g*) **men-gi(n)* > (with loss of *-n-*) *me-gi* 'we two'.

Sumerian: Of interest here are the forms *ki-*$^{me\text{-}en}$*min* 'two', *ki-2-en-ta* 'twice', and *ki-2-še*$^{(še)}$ 'twice', where the common element *ki-* resembles both in form and meaning the dual form **ki(n)* that Greenberg posits for Eurasiatic.

16.21. Plural **-t^ha* (Greenberg: §15. Plural T; Dolgopolsky 2008, no. 2240, **tV* a postnominal marker [pronoun ?] of plurality ['together']; Fortescue 1998: 96—123)

A. Afrasian: A plural marker *-ta* is found in Cushitic. In Kambata, for instance, the most common plural suffix is *-ata*, as in *duunn-ata* 'hills', (sg. *duuna*). This suffix occurs elsewhere in Highland East Cushitic: cf. the Sidamo plural suffix *-oota* in *ballicca* 'blind one', (pl.) *balloota*. Also note Galla / Oromo: *nama* 'man', (pl.) *namoota*. A plural marker *-t* (~ *-d*) also occurs in Omotic (cf. Bender 2000:212—213). Ehret (1995:17) notes that "[a] distinct Afroasiatic suffix in **t*, a nominal plural marker, may be reflected in the Egyptian cases where **t* indicates a collectivity". Later, Ehret (1995:27) lists a number of nominal suffixes that are most certainly ancient in Afrasian, including "plurals in t, probably reconstructible as **-at-*, seen in Semitic, Egyptian (as the collective **t*), Cushitic, and Omotic." Note also the remarks concerning *t*-plurals in Semitic by Lipiński (1997:241—242): "Some nouns, both masculine and feminine, without the *-t* mark of the feminine in the singular, take the 'feminine' ending in the plural. This phenomenon assumes larger proportions in Assyro-Babylonian and especially in North Ethiopic where the 'feminine' plural ending *-āt* is widely used for masculine nouns. Also the external plural in *-očč* / *-ač*, used for both genders in South Ethiopic (§31.17) and in some Tigre nouns, originates from an ancient **-āti*, which was the ending of the plural oblique case: the vowel *i* caused the palatalization of *t* and was absorbed in the palatal. In Assyro-Babylonian, some of the nouns in question are really feminine also in the singular, as e.g. *abullu(m)*, 'city gate', plur. *abullātu(m)*, or *eleppu(m)*, 'ship', plur. *eleppētu(m)*. Other nouns however, as e.g. *qaqqadu(m)*, 'head', plur. *qaqqadātu(m)*, or *ikkaru*, 'peasant', plur. *ikkarātu(m)*, are

masculine in both numbers. A third group consists of nouns which are masculine in the singular, but are treated as feminine in the plural, e.g. *epinnu(m)*, 'plough', plur. *eppinētu(m)*, or *eqlu(m)*, 'field', plur. *eqlētu(m)*. The situation is similar to Ugaritic with nouns like *ksủ*, 'chair', or *mṯb*, 'dwelling', which have the plurals *ksảt* and *mṯbt*. We know at least that *ksủ* is also feminine in the singular. In North Ethiopic the ending *-āt* is used instead of the masculine plural morpheme *-ān* without influencing the gender of the nouns (e.g. Geʿez *māy*, 'water', plur. *māyāt*; Tigrinya *säb*, 'person', plur. *säbat*), while the morpheme *-ān* (§31.12) is employed for adjectives and participles (e.g. Geʿez *ḥadis*, 'new', plur. *ḥadisān*), and for a smaller number of substantives. In Tigrinya, the plural is *-tat* after vowels (e.g. *gäza* 'house', plur. *gäzatat*), even when the final vowel has only an auxiliary function (§27.16), as in *ləbbi*, 'heart', plur. *ləbbətat* (§31.20). Besides the plural ending *-očč* (§31.17), Amharic continues using the Old Ethiopic ending *-āt*, mainly with masculine nouns or with nouns unspecified as to gender, e.g. *hawaryat*, 'apostles', *ləsanat*, 'languages', *gädamat* 'converts'. The wide use of the ending *-āt* can best be explained by the original function of the morpheme *-t-* forming collective nouns (§30.1). However, a side influence of the Cushitic adstratum on Ethiopic should not be excluded, since *-t-* is the most common Cushitic marker of the plural, also in Highland East Cushitic." Plural suffixes in **-Vt-* are also found in Southern Cushitic (cf. Ehret 1980:54—55): Proto-Southern Cushitic **-ata* > Iraqw *-ta* in *qarta*, plural of *qari* 'age-mate', *-t* adjective plural, K'wadza *-ata*, Asa *-at-* in complexes of the form *-atVk*, Dahalo *-Vtta*; Proto-Southern Cushitic **-etu* > K'wadza *-etu*, Dahalo *-ettu*; Proto-Southern Cushitic **-ota* > Asa *-ot-* in complexes *-otVk*, Dahalo *-Vtta*; Proto-Southern Cushitic **-uta* > Asa *-ut*, Dahalo *-Vtta*. Finally, Bender (2000:214) remarks: "Plural *t* is not so common: Egyptian and Semitic have it, but it is lacking in Berber and Chadic. Cushitic and Omotic both are strong in plurals involving *n* and also *t*." For example, in Kullo, which is part of Northwest Ometo branch of Omotic, plurals are usually formed by adding the suffix *-(a)tu* to the head of the noun phrase, as in: *asatu* 'people' (sg. *asa* 'person'), *kanatu* 'dogs' (sg. *kana* 'dog'), *naatu* 'boys' (sg. *naa* 'boy'), *kutatu* 'chicken(s)' (sg. *kutu* 'chicken').

B. Kartvelian: Note that a plural marker *-t(a)* is also found in Kartvelian in the so-called "*n*-plural"; cf. the Old Georgian *n*-plural case forms for *perq-i* 'foot' (cf. Fähnrich 1994:56):

Nominative	*perq-n-i*
Ergative	*perq-t(a)*
Genitive	*perq-t(a)*
Adessive	*perq-t(a)*
Dative	*perq-t(a)*
Instrumental	*perq-t(a)*
Adverbial	*perq-t(a)*
Vocative	*perq-n-o*

Thus, there are really only three distinct case forms in the *n*-plural, namely, nominative, vocative, and oblique (that is, all the other cases). There is also a plural marker *-eb-*, which was probably originally collective. The plural ending *-t(a)* is also found in pronoun stems in the oblique cases. Finally, note that a plural marker *-t* is also found in verbs — cf., for instance, the Old Georgian present forms of the verb *c'er-* 'to write' (cf. Fähnrich 1994:85):

	Singular	Plural
1st person	*v-c'er*	*v-c'er-t*
2nd person	*s-c'er*	*s-c'er-t*
3rd person	*c'er-s*	*c'er-en*

As a plural suffix of the first and second persons in the verb (subjective conjugation), **-t* is found in Mingrelian and Laz as well (cf. Fähnrich 1994:240 and 2007:185—186; Fähnrich—Sardshweladse 1995:153—154).

C. Uralic: According to Collinder (1960:297), the nominative plural ending was **-t* in Proto-Uralic: cf. Finnish *kala* 'fish', (pl.) *kalat*; Lapp / Saami (pl.) *guolet*, *guolek* (*-k* < **-t*) 'fish'; Mordvin (Erza) (pl.) *kalt* 'fish'; Vogul / Mansi (pl.) *hult* 'fish'; Ostyak / Xanty (pl.) *kult* 'fish'; Yurak Samoyed / Nenets (pl.) *haale?* 'fish'. See also Abondolo 1998a:21; Décsy 1990:72—75. Regarding plural endings in Uralic, Marcantonio (2002:229) notes: "Most U[ralic] languages, like Finnish, Vogul, Ostyak, Samoyed, have an ending *-t*, as in Finn[ish] *talo-t* 'houses'. This morpheme *-t* is also used in the verbal conjugation in several languages, for example in Vogul…" See also Sinor 1952:211.

D. Altaic: Common Mongolian had a plural suffix **-t* (cf. Sinor 1952:211—212). This suffix is preserved in Ordos, Khalkha, Buriat, and Moghol. In Mongolian, it appears as *-d*, in Dagur as *-r*, and in Kalmyk as *-D* (see the table in Poppe 1955:183). Though Poppe (1955:178—184) reconstructs a Common Mongolian plural suffix **-d*, Greenberg (2000:107) cites an earlier work by Poppe in which he derives **-d* from an earlier **-t*. Tungus: Manchu *-ta* and *-te* form the plural of certain kinship terms. Turkic has a few forms with a relic plural *-t* (cf. Menges 1968b:111; Sinor 1952:212—213). For Proto-Altaic, Starostin—Dybo—Mudrak (2003:221) reconstruct a plural suffix **-t'-* on the basis of: Proto-Tungus **-ta(n)*/**-te(n)* (basically in Manchu; in other Tungus languages, it is used as the 3rd plural pronominal suffix); Mongolian *-d*; Proto-Turkic **-t*; Proto-Japanese **-ta-ti*; Proto-Korean **-tï-r*. They note: "This is the most common and probably original P[roto-]A[ltaic] plural suffix."

E. Gilyak / Nivkh: Suffix **-t* is used to indicate the plural in all three persons in the participle indicating action simultaneous with that of the main verb (cf. Greenberg 2000:107).

F. Chukchi-Kamchatkan: Greenberg (2000:120; see also 107—108, §15) notes that the plural of nouns in declension I in Chukchi "is *-t* after vowels and *-ti* ~ *-te* after consonants". Declension I distinguishes singular from plural only in the absolutive. In declension II, singular and plural are distinguished in all

cases. In the absolutive, the plural is *-n-ti* ~ *-n-te*, formed with the *-n* plural formant discussed below plus the plural endings *-ti* ~ *-te* under discussion here.

G. Eskimo: A plural marker **-t* is also found in Eskimo (cf. Greenberg 2000:108; Fortescue—Jacobson—Kaplan 1994:441).

16.22. Plural **-ri* (Greenberg: §17. Plural RI; Dolgopolsky 2008, no. 1953a, **r[i]* a particle of plurality/collectivity)

A. Afrasian: A plural marker *-r* is found in Omotic: cf. the Zayse plural suffix *-ir* in, for example, *šóoš* 'snake', (pl.) *šóoš-ir*. Cf. also Bender 2000:214.

B. Dravidian: Note here the Proto-Dravidian plural marker **-(V)r*, used with nouns of the personal class and pronouns (cf. Tamil *avan* [sg.] 'that man', [pl.] *avar* 'those people') (cf. Krishnamurti 2003:206—207; Zvelebil 1977:15—16). Particularly interesting is the close agreement here with Manchu, where, as Greenberg remarks (2000:113), the plural *-ri* is confined to certain kinship terms. Finally, Krishnamurti (2003:308) reconstructs a Proto-Dravidian third plural (human) verb suffix **-ăr* > Old Tamil *-ar*, *-ār(kaḷ)*; Old Malayalam *-ār*; Iruḷa *-ar(u)*, *-ār*; Kota *-ār*; Kannaḍa *-ar(u)*, *-ār*, *-or*; Tuḷu *-ëri*; Koraga *-ëri*; Telugu *-ru*, *-ri*; Konḍa *-ar*; Kui *-eru*; Kuwi *-eri*; Pengo *-ar*; Manḍa *-ir*; Kolami *-ar*, *-er*; Naikṛi *-ar*, *-er*, *-r*; Parji *-ar*, *-or*, *-er*, *-ir*, *-r*; Gadba *-ar*, *-er*, *-or*, *-r*; Kuṛux *-ar*, *-r*; Malto *-er*, *-ar*, *-or*; Brahui *-ir*, *-ēr*. This has a close parallel in Indo-European (see below).

C. Kartvelian: Proto-Kartvelian plural suffix **-ar* > Georgian *-ar*; Svan *-ar* (Upper Svan *-är*). In Upper Bal, this is changed to *-äl*, but in Lower Bal, *-är* has mostly been generalized. Cf. Fähnrich—Sardshweladse 1995:35; Fähnrich 2007:38.

D. Indo-European: Verbal third person endings in *-r* are found in Indo-Iranian, Hittite, Italic, Venetic, Celtic, Phrygian, and Tocharian (cf. Szemerényi 1996:242—243: "It follows that the *r*-forms were originally limited to the primary endings and, there, to the 3rd persons. The early forms were for Latin *-tor*/*-ntor*, for Hittite *-tori*/*-ntori*, for Old Irish [giving conjunct endings *-ethar*/*-etar*] *-tro*/*-ntro*."). According to Lehmann (2002:171), **-r* was originally used to mark the third plural in the stative in early Proto-Indo-European. This contrasted with third plural **-n* in the active. This **-n* was later extended by **-t^h*, which itself was further extended by the deictic particle **-i*, meaning 'here and now', to form the later Proto-Indo-European third plural primary ending **-nt^{h}i*.

E. Uralic: In her discussion of plural markers in Uralic, Marcantonio (2002:231) notes: "Finally, one should mention the ending *-r*, although its distribution is very restricted. It is present in the function of a collective suffix in Samoyed Yurak and in Cheremis." Sinor (1952:217) also notes that Cheremis / Mari had a denominal collective suffix in *-r* and cites the following example: *lülper* 'alder grove' (*lülpə* 'alder'). For Yurak Samoyed / Nenets, Sinor cites *kārβ-rie* 'larch grove' (*kārβ* 'larch') as an example.

F. Altaic: As noted by Greenberg (2000:113), a nominal plural marker *-ri* occurs in Manchu in conjunction with certain kinship terms. Benzing reconstructs a Common Tungus **-ri* as the plural of reflexive pronouns. Sinor (1952:216) cites the following examples: Manchu *mafa-ri* 'grandmothers' (sg. *mafa* 'grandmother'); Nanay / Gold *məpəri* plural of the reflexive pronoun (for all persons) (acc. sg. *məpi*); Evenki: words ending in *-n* may form their plural by replacing the *-n* with *-r*, as in: *oror* 'deer' (sg. *oron* 'deer'), *murir* 'horses' (sg. *murin* 'horse'). This form is also found in Turkic. The Pre-Proto-Turkic first and second personal plural personal pronouns may be reconstructed as **mi-ri* and **si-ri*, respectively. These yielded Proto-Turkic **mi-r^{y}* (> **bi-r^{y}*) and **si-r^{y}* (the following forms are all nominative plural): Turkish *biz* 'we', *siz* 'you'; Tatar *běz* 'we', *sěz* 'you'; Kazakh *biz* 'we', *siz* 'you'; Noghay *biz* 'we', *siz* 'you'; Kirghiz *biz* 'we', *siz* 'you' (polite, to one addressee); Uzbek *biz* 'we', *siz* 'you'; Uighur *biz* 'we', *siz* 'you' (now used as the polite form only); Chuvash *epir* 'we', *esir* 'you'. Cf. Johanson—Csató 1998. It may be noted here that the Common Turkic plural suffix **-lAr* is most likely composed of the plural/collective suffix **-la* (discussed below) plus the plural suffix **-r(i)* (cf. Sinor 1952:226). Starostin—Dybo—Mudrak (2003:222) note: "Above we have already dealt with the suffix **-ŕV* which may have had an original dual meaning. Outside Turkic the reflexes of **-ŕ-* cannot be distinguished from those of **-r-*, and it seems interesting to note the peculiar plural in **-r* in T[ungus-]Manchu, which occurs in nouns whose singular ends in **-n*…"

G. Chukchi-Kamchatkan: Plural ending *-ri* in *mu-ri* 'we', *tu-ri* 'you', and the third person plural independent pronoun in the nominative case *ət-ri* 'they' (cf. Greenberg 2000:112—113).

H. Gilyak / Nivkh: A plural formant *-r* is found in (Amur) *me-r* 'we' (inclusive) (cf. Gruzdeva 1998:26).

I. Etruscan: Note the nominal plural endings *-ar*, *-er*, and *-ur* (cf. [sg.] *clan* 'son', [pl.] *clenar* 'sons'). Cf. Bonfante—Bonfante 2002:83.

16.23. Plural **-k^{h}u* (Greenberg: §18. Plural KU; Dolgopolsky 2008, no. 837, **kU* particle of plurality)

A. Afrasian: For Proto-Southern Cushitic, Ehret (1980:58—59) reconstructs the following nominal plural suffixes: (a) Proto-Southern Cushitic **-aaki* > Iraqw, Alagwa *-akw* adjective plural suffix (underlying **-ako*), K'wadza *-aki* (also *-ako*), Asa *-ak* (also *-aka*), Dahalo *-aaki* (also *-aake*); (b) Proto-Southern Cushitic **-eeki* > Asa *-ek*, Dahalo *-eeki* (also *-eeke*); (c) Proto-Southern Cushitic **-ooki* > Asa *-ok*, Dahalo *-ooki*; (d) Proto-Southern Cushitic **-uuka* > K'wadza *-uka* (also *-uko*), Asa *-uk* (also *-uko*, *-uk*), Dahalo *-uuka* (also *-uuke*). Ongota has a pronominal plural suffix *-ku* (cf. Fleming 2002b:40).

B. Dravidian: The most common plural marker in Proto-Dravidian has been reconstructed by Zvelebil (1977:12—15) as **-(n)kVḷ(u)*, while Krishnamurti (2003:206—207) reconstructs three forms, the last of which is a combination

of the first two: **-nk(k)*, **-Vḷ*, and **-nk(k)Vḷ*. According to Jules Bloch, the plural ending **-(n)kVḷ(u)* developed from the coalescence of the two plural markers **-k(V)* and **-Vḷ(u)* — this agrees with Krishnamurti's analysis. Specifically, Zvelebil (1977:14—15) remarks: "...from the existence of only the reflexes of **k* in North Dravidian (Brahui) and Gondi-Konda Kui-Kuvi, we may infer that the *velar stop* is preferably to be regarded as the earliest Dravidian suffix of substantive plurals of the non-personal class." The Dravidian plural suffix **-k(V)* may be compared with the forms under discussion here.

C. Indo-European: On Armenian, see above (Greenberg's §14. Dual KI[N]).

D. Uralic: Marcantonio (2002:234—235) notes: "Unlike most U[ralic] languages, Hungarian has a different Plural ending, used both for nouns (in 'non-oblique' Cases), and for verbs: the ending *-k*. A Plural *-k* is also found in Lapp, although this is generally considered as deriving from **-t*…" Further, she notes: "The origin of *-k* is disputed. Some researchers believe that it derives from a derivational suffix **-kkV*, compare Finn[ish] *puna-kka* 'rubicund' from *puna* 'red' (Abondolo 1988b: 439). This explanation looks a bit far fetched. Abondolo himself (ibid.) also considers the possibility that the verbal element *-k* is the same as the possessive element *-k* in *uru-n-k*. This is indeed the interpretation which is chosen here, but this interpretation still does not tell us where the component *-k* comes from. Aalto (1969/78: 326) considers the possibility of connecting **-k* with the Samoyed co-affixal element **-k*(Ø)- discussed above (Section 8.4.1), as well as with the Tungus, Turkic and Mongolian collective ending *-g*. Menges (1968/95: 129) on the other hand remarks that in a number of Turkic languages the 1st Poss. Plu. *-ym ~ -yz* (normally used in connection with a verbal noun) is replaced by *-yq ~ -ik* (the two forms coexist in some languages), whose origin is considered unclear, but whose meaning and sound-shape could be connected with Hung. *-k*. A Plural *-k* also exists in Dravidian." Collinder (1965:106) notes: "[t]he ending *-ikko* often forms collective nouns, as in [Finnish] *koivikko* (seldom *koivukko*) 'birch grove'."

E. Gilyak / Nivkh: Amur plural suffixes: *-ku*/*-γu*/*-gu*/*-xu*; East Sakhalin: *-kun*/*-γun*/*-gun*/*-xun*; East and North Sakhalin *-kunu*/*-γunu*/*-gunu*/*-xunu*. As noted by Gruzdeva (1998:16), "one or another phonetic variant of the suffix is chosen according to the rules of morphophonological alternation". Gilyak / Nivkh also forms plurals by means of reduplication.

F. Eskimo: Greenberg (2000:115—116) devotes most of the discussion to the Eskimo plural forms containing *-ku*.

16.24. Plural **-sʸa* (Greenberg: §19. Plural S)

In view of the evidence from Southern Cushitic, this may originally have been an adverbial particle meaning 'very, very much'; it became a plural marker in both Southern Cushitic and Eurasiatic.

A. Afrasian: Ehret (1980:329, D.1.) reconstructs Proto-Southern Cushitic **ša* or **šaa* 'very, very much' (> K'wadza *seʾem* 'every, each', plurals in *-Vs-*, *-Vds-*; Asa *šaʾi* 'many', plurals in *-Vš-*; Ma'a *ša* 'very, very much').

B. Indo-European: In the traditional reconstruction of the noun stems, an **-s* is added to the case endings in the plural: nominative-accusative (consonant stems, masculine and feminine) **-es*; accusative (masculine and feminine) **-ns*/**-n̥s*; ablative **-bhyos*/**-bhos*, **-mos*; dative **-bhyos*/**-bhos*, **-mos*; locative **-su*; and instrumental **-bhis*, **-mis*; **-ōis* (cf. Szemerényi 1996:160; Burrow 1973:235—240). An **-s* is also found in several plural forms in the personal pronouns (cf. Szemerényi 1996:216—218). An **-s* is sometimes used to indicate the plural in the first and second person personal endings in verbs: first person plural: (primary) **-mesi*, (secondary) **-mes*; second person plural: (primary) **-tʰesi*, (secondary) **-tʰes* (cf. Burrow 1973:308; Szemerényi 1996: 235). An alternative form in which **-n* appears as the plural marker in these persons is attested as well (in Hittite, for example). In the second person plural, the ending could also appear in an unextended form, **-tʰe*.

C. Altaic: In Mongolian, the ending *-s* is one of the means used to indicate plurality (cf. Poppe 1955:177—178): cf. Mongolian *aγulas* 'mountains' (sg. *aγula*), *eres* 'men' (sg. *ere*), *noqas* 'dogs' (sg. *noqai*), *erdenis* 'jewels' (sg. *erdeni*), *üges* 'words' (sg. *üge*), *tengris* 'gods' (sg. *tengri* 'heaven, god'), *aqas* 'older brothers' (sg. *aqa*), *moγas* 'snakes' (sg. *moγai*), etc.; Moghol (*s* ~ *z* variation) *tàkà·z* 'bucks', *taχta·z* 'boards', *šānā·z* 'combs', etc.; Ordos *emes* 'women', etc.; Khalkha *ūlɒs* 'mountains', *erəs* 'men', etc.; Kalmyk *zalūs* 'young men', *tšonᵒs* 'wolves', *noχᵒs* 'dogs', etc. In Manchu, there is no common nominal plural marker, several distinct suffixes being found: *-sa*, *-so*, *-se*, *-si*; *-ta*, *-te*; *-ri*: cf. *hahasi* 'men' (sg. *haha*), *amata* 'fathers' (sg. *ama*), *mafari* 'grandfathers' (sg. *mafa*) (cf. Sinor 1968:264). Sinor (1952:218) considers the Manchu plural suffixes *-sa*, *-so*, *se*, *-si* to be loans from Mongolian. Greenberg (2000:117) also notes that, in Old Turkish, *-s* is used to indicate the plural in names of ranks and nationalities (but see Sinor 1952:219—220, who argues against the existence of an *-s* plural in Turkic). According to Poppe (1955:175), the plural markers **-n*, **-s*, and **-t* (Poppe writes **-d*, but see above) were inherited from Common Altaic. Starostin—Dybo—Mudrak (2003:222) reconstruct a Proto-Altaic plural suffix **-s-* on the basis of: Proto-Tungus **-sa-l*; Proto-Mongolian **-s*. They note: "This suffix is restricted to the T[ungus-]M[anchu]-Mong[olian] Area, and may in fact reflect the P[roto-]A[ltaic] collective **-sa*."

D. Eskimo-Aleut: As noted by Greenberg (2000:117), *-s* is "the basic indicator of plurality throughout the inflectional system…" in the central dialects of Aleut.

16.25. Plural/collective **-la* (Greenberg: §20. Collective L; Nafiqoff 2003:95—97 **l/a/*; Illič-Svityč 1971—1984.II:16, no. 248, **-lA* suffix of collective nouns; Dolgopolsky 2008, no. 1249, **l̩A* analytical ([in descendant languages] → synthetic) marker of collectivity)

A. Afrasian: For Proto-Southern Cushitic, Ehret (1980:58) reconstructs the following nominal collective suffixes: (a) *-*ala* > Asa -*ala* in *lawala* ‘truth’, K’wadza -*ala* noun plural suffix; (b) *-*ela* > Iraqw -*eli* noun plural marker, Asa -*ela* noun plural/collective marker, Dahalo -*la* in *nala* ‘honey’ (contraction of **naɬlela* or **naɬlala*).

B. Dravidian: The Dravidian (non-human) plural marker *-*Vḷ(u)* mentioned above and discussed in detail by Krishnamurti (2003:206—207 and 215—217) should probably be included here. See also Zvelebil 1977:14—15.

C. Uralic: According to Greenberg (2000:117), a suffix -*l(a)* with collective meaning is found in Estonian and Cheremis / Mari. In Selkup, this suffix functions as a plural. See also Collinder 1960:260, §778. Marcantonio (2002:230) notes: “An ending of more restricted, although not of less complex distribution within U[ralic] is -*l*, which in fact is not always reconstructed for P[roto]-U[ralic]. It is present in Ostyak, in Cheremis and in Samoyed. In Samoyed Selkup it is present in the form -*la*, simply to mark Plurality, as in *loga* ‘fox’ vs *loga-la* ‘fox-Plu.’. However, here it can also express Plurality in connection with Possession, as in *loga-la-m* alongside with *loga-ni-m*, which both mean ‘fox-Plu.-my, my foxes’… In Eastern Ostyak -*l* is a marker of Plurality only in connection with Possession (-*t* otherwise), as in *weli-t* ‘reindeer-Plu., reindeers’ vs *weli-l-äm* ‘reindeer-Plu.-my, my reindeers… This formant is also the marker of Plurality of the Definite Object within the Definite Conjugation.”

D. Altaic: Greenberg (2000:118) mentions that, in Turkic, a collective suffix -*ala* ~ -*la* is used with numerals. According to Róna-Tas (1998:73), the Common Turkic plural suffix in nouns was *-*lAr*. This is most likely a compound suffix composed of the plural/collective suffix *-*la* under discussion here plus the plural suffix *-*r(i)* discussed above. Examples: Middle Kipchak *yuŋlar* ‘feathers’, *oqlar* ‘arrows’, *išler* ‘things’, *ölüler* ‘dead people’, etc.; Turkish *sular* ‘masses of water’, *evler* ‘houses’, etc.; Azerbaijani *atlar* ‘horses’, *ėvler* ‘houses’, etc.; Turkmenian *kitaplar* ‘books’, *atlar* ‘horses’, etc.; Tatar: the plural suffix is -*LAr*; Kazakh: the plural marker is -*LAr*; Noghay *suwlar* ‘masses of water’, *üyler* ‘houses’, etc.; Uzbek: the plural ending is -*lär*; Yakut *tabalar* ‘reindeer’, etc. For Tungus, Sinor (1952:214) cites the following examples of plural -*l*: Evenki *ǰul* ‘houses’ (sg. *ǰu*); Lamut / Even *delal* ‘heads’ (sg. *del*); Nanay / Gold: “[t]he -*l* appears not as a nominal plural suffix but only in the 3rd pers. plural of some verbal forms. In these cases it is used to differentiate the plural form from the singular. For example: In the subjunctive (the term is inexact): *bumcə* ‘he would give’, *bumcəl* ‘they would give’.” Sinor (1952:214) also mentions that a plural -*l* appears in Middle Mongolian, as in: *kimul* ‘nails’ (cf. Classical Mongolian sg. *kimusun* ‘nail’), *dabaγal* ‘mountain passes’ (sg. *dabaγa* ‘mountain pass’). Starostin—Dybo—Mudrak (2003:222) reconstruct a Proto-Altaic plural suffix *-*l*- on the basis of: Proto-Tungus *-*l*; Proto-Turkic *-*lar*; Proto-Mongolian *-*nar*; Proto-Japanese *-*ra*. They note: “In Turkic, Mongolian, and Japanese this suffix seems to have been originally restricted to forming plurals of animate nouns, and in Japanese it basically

reflects associativity (‘brothers and those together with them, assoicated with them’). Ramstedt (EAS 2) suggests it was originally a separate noun **larV* which accounts for the specific reflex *n-* in Mongolian (otherwise typical for **l-* in word-initial position, see above). Turkic and Japanese already treat it as suffix (word-initial **l-* is absent in Turkic, just as word-initial **r-* is absent in Japanese). Loss of **-rV* in T[ungus-]Manchu and Japanese, however, is difficult to account for — perhaps one should think of an early assimilative process in a suffixed morpheme (something like **-larV* > **-lrV-* > **-llV*).” My own views differ somewhat from those of Starostin—Dybo—Mudrak. I take Mongolian **-nar* to be a reflex of the Proto-Nostratic plural suffix **-nV*, and I take Proto-Turkic **-lA-r* to be a compound suffix (see above).

E. Chukchi-Kamchatkan: Proto-Chukchi-Kamchatkan affix **-la-* ‘several (do)’ > plural marker in verbs in Kerek, Alyutor, and Koryak (cf. Fortescue 2005:413).

16.26. Plural **-nV* (Greenberg: §21. Personal N; Illič-Svityč 1971—1984.II:94—96, no. 333, **-nA* suffix of plural of animate nouns; Nafiqoff 2003:93—95 **NA*; Dolgopolsky 2008, no. 1522, **n̄[ä]* pronoun of collectivity and plurality)

My comments will only address the pluralizing function of Greenberg’s Personal N.

A. Afrasian: In Geez, the masculine external plural is *-ān*, which is related to the Akkadian plural marker (nom.) *-ānu* (cf. Lipiński 1997:239—240). A plural suffix *-n* occurs elsewhere in Afrasian: In Egyptian, the personal endings added to the stative (old perfective, or pseudoparticiple) conjugation add *-n* in the plural (cf. Loprieno 1995:65). Furthermore, Loprieno (1995:64) notes that the plural forms of the suffix pronouns, “common to both masculine and feminine, show the addition of an element *n* (in the dual *nj*) to the singular: (1) first person plural = *n* (***-ina* > **-in*), dual = *nj* (**-inij*); (2) second person plural = *t̲n* (from ***-kina*; the front vowel led to palatalization of the velar stop: **-t̲in*), dual = *t̲nj* (**-t̲inij*); (3) third person plural = *sn* (***-sina* > **-sin*), dual = *snj* (**-sinij*).” In Burji, for example, there are a few plurals formed with a suffix *-nna*/*-nno*: *gót-a* ‘hyena’, (pl.) *got-ínna*; *saa-yí* ‘cow’, (pl.) *saa-yanna*, *sa-ynaa*; *rud-áa* ‘sibling’, (pl.) *rud-áannoo* (data from Sasse 1982). Note also the plural suffix *-n* in Berber: Tamazight *ass* ‘day’, (pl.) *ussa-n*; *asif* ‘river’, (pl.) *i-saff-ən*. In Tamazight, *i-* is prefixed, and *-n* is suffixed to masculine nouns to form so-called “sound plurals”, while the prefix *ti-* and the suffix *-n* serve the same function for feminine nouns (in rare cases, one finds *ta-...-in* instead). Nouns ending in vowels add one of the following suffixes: *-tn*, *-wn*, or *-yn*. Thus, the common marker for “sound plurals” in Tamazight is *-n*. (There are also so-called “broken plurals”, which do not add *-n*.) In Semitic, there is a so-called “intrusive *n*” found in the plural of the personal pronouns. Though Gelb (1969:50—53) explains this as “a consonantal glide introduced in order to avoid two contiguous vowels”, it is curious that it is only found in the plural

and that no such "consonantal glide" appears to be needed elsewhere. This leads me to suspect that we may be dealing here with a relic of the plural *n* under discussion here. A plural suffix *-n* occurs in Omotic, though, as Bender (2000:212) points out, "There is no pervasive Omotic plural suffix. Both *n* and *t* (~ *d*) are found in pls.". According to Newman, a plural in *-n-* is widespread in Chadic (cited in Bender 2000:213). For Proto-Southern Cushitic, Ehret (1980:56) reconstructs the following plural suffixes: (a) Proto-Southern Cushitic *-*ena* > Iraqw *-en* adjective plural, *-(V)na* plural suffix; Burunge *-en* adjective plural; K'wadza *-Vn-* plural marker in complexes, *-VnVk-*, *-en(d)-* in complex *-endayo*; Asa *-Vn(d)-* plural marker in complexes, *-VndVk-*; Ma'a *-ena* plural suffix; Dahalo *-eena* plural suffix; (b) Proto-Southern Cushitic *-*eno* > Burunge *-eno* plural suffix; K'wadza *-Vn-* plural marker in complexes, *-VnVk-*, *-en(d)-* in complex *-endayo*; Asa *-Vn(d)-* plural marker in complexes, *-VndVk-*; Ma'a *-no* suffix attached to nouns indicating a great number or quantity. Note also the Hamer (Omotic) particular plural suffix *-na*. Finally, Bender (2000:214) notes: "Most Afrasian families have plurals involving *n*, with Egyptian and Semitic being the weakest."

B. Kartvelian: A plural suffix *-n* is found in Kartvelian as well: Georgian plural suffix in nouns *-n* (cf. *k'ac-n-i* 'men', *mta-n-i* 'mountains', *zγwa-n-i* 'seas', etc.); Laz plural suffix *-n* (cf. *ha-n-i* 'these', etc.). Fähnrich (1994:55—67) lists numerous examples from Old Georgian. Cf. Fähnrich 1994:252—253 and 2007:311; Fähnrich—Sardshweladse 1995:258.

C. Indo-European: There is also evidence for a plural marker *-*n* in Indo-European in verbs. In Hittite, the first person plural personal endings are (present) *-weni* (occasionally also *-wani*; but *-meni* after stems ending in *-u-*), (preterite) *-wen* (*-men* after stems ending in *-u-*); the second person plural personal endings are (present) *-teni* (occasionally also *-tani*), (preterite) *-ten*. In Greek, there is a first plural ending (primary and secondary) -μεν (there is also an alternative ending -μες). In Sanskrit, in addition to the second plural personal endings (primary) *-tha* and (secondary) *-ta*, there are extended forms *-thana* and *-tana* respectively. In Sanskrit, the first plural endings are (primary) *-mas*, *-masi* and (secondary and perfect) *-ma*, that is to say, they do not contain the plural marker *-n* found in Hittite and Greek. It is thus now clear how the different plural personal endings found in the daughter languages came to be. The earliest forms were (first person plural) *-*me* and (second person plural) *-*t^he*. These could be extended (optionally) by an ancient plural marker *-*n*, yielding *-*men* and *-*t^hen* respectively. At a later date, when the so-called "primary" endings were formed, these endings could be further extended by the primary marker *-*i*, giving *-*meni* and *-*t^heni* respectively. Conversely, the plural marker *-*s* could be used instead, at least with the first person plural, yielding *-*mes*, and, later, with the addition of the primary marker, *-*mesi*. The dual *-*n*-marker identified by Witczak (2001) in residual forms in several Indo-European daughter languages may ultimately belong here as well.

D. Uralic: Common Uralic plural suffix *-*n*, which is "limited mainly to the personal endings" (cf. Décsy 1990:74—75; Sinor 1952:205—207). Collinder

(1960:303, §960), however, identifies this as a dual for personal pronouns and possessive suffixes. Marcantonio (2002:229—230) notes: "Another frequent morpheme of Plurality is *-(a)n*, which is found for example in Zyrian, Mordvin, Samoyed, Estonian (as a prefix in Personal pronouns), and Vogul. In this last language it is also used in connection with verbs, to express Plurality of the Definite Object in the Definite Conjugation. It is mainly used to form Plurality of nouns when the Possessive ending is present as well, and it indicates Plurality of the Possession (and/or Possessor). Compare Vog[ul] *kol* 'house', *kol-um* 'my house' vs *kol-an-um* 'house-Plu.-my, my houses'…" "The formant *-n* is generally believed also to have existed in P[roto]-Finnish. For example, in modern Finnish the form *talo-mi* has two grammatical meanings: (1) 'my house' < **talo-mi* (where **-mi* is the 1st Possessive); (2) 'my houses' < **talo-n-mi*, where *-n* indicates Plurality."

E. Altaic: Sinor (1952:207—208) observes: "So far as I can see, Grönbech was the first to demonstrate the existence of a Turkish plural suffix *-n*. It is absent from the modern dialects and it is quite clear that even in Old Turkish it was already obsolescent. It occurs mainly with two words *oγul* 'boy, son' and *är* 'man', the plurals of which are respectively *oγlan* and *äräṅ*." On the Proto-Mongolian plural suffix **-nar*, see above under plural/collective **-la*.

F. Chukchi-Kamchatkan: Greenberg (2000:120; see also 107—108, §15) notes that the plural of nouns in declension I in Chukchi "is *-t* after vowels and *-ti* ~ *-te* after consonants". Declension I distinguishes singular from plural only in the absolutive. In declension II, singular and plural are distinguished in all cases. In the absolutive, the plural is *-n-ti* ~ *-n-te*, formed with the *-n* plural formant under discussion here plus the plural endings *-ti* ~ *-te*.

Sumerian: In Sumerian, the plural of animate nouns is indicated by the suffix *-ene*. This ending is also found in the second and third plural possessive suffixes: (2nd pl.) *-zu.ne.ne*, *-zu.ne*, and *-zu.e.ne.ne* 'your'; (3rd pl.) *-a.ne.ne* 'their'. This suffix appears to be close both in form and function to the material gathered here.

III. RELATIONAL MARKERS

16.27. Direct object **-ma* ~ **-na* (Greenberg: §24. Accusative M; Dolgopolsky 1984:92 **-ma* postpositional marker of a definite direct object [accusative], 1994:2838 accusative **ma*, and 2008, no. 1351, **mA* particle of marked accusative; Illič-Svityč 1971—1984.II:48—51, no. 285, **-mA* suffixal formant of the marked direct object; Michalove 2002a; Fortescue 1998:103)

There is evidence for both direct object markers **-m* and **-n*. **-m* is found in Indo-European, Uralic, Mongolian, Tungus, and the Aroid branch of Omotic within Afrasian. **-n* is found in Elamo-Dravidian, Etruscan, the Dizoid Branch of Omotic within Afrasian, Turkic, and possibly even in Indo-European in the accusative plural. The original forms of these formants may have been **-ma* and **-na*.

A. Afrasian: There are traces of both of these endings in Omotic. In Aari, "[i]n direct object function the head of a definite NP receives an accusative suffix -m" (Hayward 1990b:443). Likewise in Dime, "[d]irect objects are indicated by the suffix -im attached to the stem of the object noun" (Fleming 1990:518). Bender (2000:211) reconstructs an accusative/absolutive formant *-*m* for the Aroid branch of Omotic. For Dizoid, he reconstructs *-*(n)a*. Zaborski (1990: 625) lists the following examples of accusative -*n*, -*na* in Omotic (see also Fleming 1976a:316): -*na* in Gofa Ometo pronouns and in Yemsa / Janjero; -*n* in Basketo pronouns, in Yemsa / Janjero, in Kefa, in Dizi (with nouns other than masculine singular), in Galila (for accusative pronoun *me*), and in Hamer. Fleming (1976a:316) also discusses accusative -*n* in Hamer, Galila, and Kefa and remarks that "South Omotic otherwise uses -*m* for direct objects on nouns and pronouns, while Dime has -*n* for the dative-benefactive."

B. Dravidian: The Proto-Dravidian accusative ending has been reconstructed as *-*(V)n* > Kota -*n*; Kannaḍa -*aM*, -*an*, -*ān*; Tuḷu -*nu*/-*nï*, -*anu*; Gondi -*n*; Koṇḍa (acc.-dat.) -*ŋ*/-*ŋi*; Pengo (acc.-dat.) -*aŋ*; Kolami -*n* ~ -*un*, -*n* (after any stem ending in a vowel, liquid, or semivowel), -*un* (elsewhere); Naikṛi -*ŋ*/-*ūŋ*; Naiki (of Chanda) -*n* ~ -*un*; Parji -*n* ~ -*in*; Gadba (Ollari) -*n* ~ -*in*; Malto -*n*/-*in* (cf. Zvelebil 1977:27—31; Krishnamurti 2003:228—230, 495, and 498). (There was also an accusative ending *-*ay* in Proto-Dravidian.) Note the Elamite accusative ending -*n* found in the declension of personal pronouns: first singular (nominative) *u* 'I', (acc.) *un*; second singular (nom.) *nu* 'you', (acc.) *nun*; etc. McAlpin (1981:109, §522.1) sets up a Proto-Elamo-Dravidian accusative singular ending *-*n*. This is not, however, quite as straightforward a comparison as I have made it out to be. In general, final *-*m* is preserved in Dravidian (though, in at least one case, namely, the Proto-Dravidian nominative suffix of some nouns with stems ending in -*a*, final *-*m* alternates with *-*n* [cf. Zvelebil 1970:127]), and, therefore, we would expect the accusative ending to have been *-*(V)m* instead of *-*(V)n* (but note McAlpin 1981:92, §314.2: "The reflexes of PED **m* are clear only in the first syllable. After that Elamite and Dravidian attest both *n* and *m* finally; *n* more commonly in Elamite, *m* more commonly in Dravidian [symbolized as PDr. **N*]. This is really no different from the situation in Dravidian where the common formative PDr. *-*aN* ... is attested in both *m* and *n* [but never in alveolar *n̲*] ..."). But, considering that an -*m* ~ -*n* variation occurs throughout Nostratic for this case, the Dravidian forms may still belong here if we assume that the variation went all the way back to Proto-Nostratic itself.

C. Indo-European: The Proto-Indo-European accusative singular masculine/ feminine ending is to be reconstructed as *-*m* (after vocalic stems) ~ *-*ṃ* (after consonantal stems), and the accusative plural masculine/feminine as *-*ns* (after vocalic stems) ~ *-*n̥s* (after consonantal stems): (a) accusative singular: Sanskrit *vṛ́kam* 'wolf'; Greek λύκον 'wolf'; Latin *lupum* 'wolf'; Gothic *wulf* 'wolf'; Lithuanian *viĨką* 'wolf'; Old Church Slavic *vlъkъ* 'wolf'; (b) accusative plural: Sanskrit *vṛ́kān* 'wolves', *sūnū́n* 'sons'; Avestan *vəhrką* 'wolves'; Greek (Cretan) λύκονς (Attic λύκους) 'wolves', υἱύνς 'sons'; Latin *lupōs* 'wolves';

Gothic *wulfans* ‘wolves’, *sununs* ‘sons’; Old Prussian *deiwans* ‘gods’ (cf. Szemerényi 1996:160; Brugmann 1904:378—379 and 391—392; Burrow 1973:231—232 and 236—237; Sihler 1995:250). Clearly, the plural form is composed of *-*n*/*-*ŋ* plus the plural marker *-*s*. If not assimilated from *-*ms*, the plural form may represent preservation of the *n*-accusative attested in Elamo-Dravidian, Etruscan, and the Dizoid branch of Omotic within Afrasian. Except for *-*o*-stems, the nominative and accusative had the same form in neuter nouns.

D. Uralic: Both Greenberg (2000:129) and Collinder (1960:284—286) reconstruct Proto-Uralic accusative singular *-*m*, which was mainly used to mark the definite direct objects of finite verbs: cf. Finnish *kalan* ‘fish’; Lapp / Saami *guolem* ‘fish’; Cheremis / Mari *kolõm* ‘fish’; Vogul / Mansi *päŋkäm* ‘his head’; Yurak Samoyed / Nenets *ŋudam?* ‘hand’; Tavgi Samoyed / Nganasan *kinda(m)* ‘smoke’; Kamassian *d'agam* ‘river’ (see also Abondolo 1998a:18—20; Décsy 1990:69; Raun 1988b:558; Sinor 1988:714—715). Marcantonio (2002:284) notes: “The Accusative -*m* is present in a few U[ralic] languages: Cheremis, some dialects of Lapp, some dialects of Vogul and Samoyed. Ostyak has -*Ø*. Perhaps reflexes of *-*m* can be found in the Finnish Accusative -*n*, in Permian and Mordvin (Hajdú 1981: 136). If present, this ending applies only to known, referential, Direct Objects, so that it might be the reflex of an original Topical marker, rather than of a proper Accusative marker. This is still the case in Vogul and this function is still transparent in the behaviour of Acc. -*n* in Finnish (see Marcantonio 1988 and 1994).”

E. Altaic: Greenberg (2000:129) discusses possible evidence from Mongolian and Tungus for an accusative *-*m*. Specifically, he notes that, in Mongolian, the first and second person personal pronouns contain a suffixal element -*ma* in all cases except the genitive (Common Mongolian first person *-*na-ma-*, second person *-*či-ma-*). This -*ma* is not found in nouns. This element is mentioned in passing by Poppe (1955:211 and 213). Greenberg takes -*ma* to be a relic of the accusative -*m*. According to Greenberg (2000:129), the accusative marker in both nouns and pronouns in Tungus is -*wa* ~ -*we*, -*ba* ~ -*be*, or -*ma* ~ -*me*, depending on the phonological environment. Sinor (1988:715) reconstructs a Proto-Tungus accusative *-*m*. He also notes (1988:714) that the accusative is -*nV* (mostly -*ni*) in the majority of the Turkic languages. Róna-Tas (1998:73) reconstructs the Proto-Turkic accusative as *-*nVG* (in the pronominal declension *-*nI*): cf. Middle Kipchak -*nI* (cf. *qulnï* ‘servant’, *aqčanï* ‘money’, *teŋirni* ‘god’, *kišini* ‘man’); Chagatay -*nI*, -*n*; Azerbaijani -*(n)I* (cf. *atanï* ‘father’, *ėvi* ‘house’, *oχu* ‘arrow’); Turkmenian -*(n)I*; Tatar and Bashkir -*nĔ* (cf. Tatar *etinë* ‘father’); Kazakh -*NI*; Kirghiz -*NI*; Uzbek -*ni*; Uighur -*ni* (cf. *balini* ‘child’, *kölni* ‘lake’, *qušni* ‘bird’, *yurtini* ‘his house’, *tügmilirimni* ‘my buttons’); Yakut -*(n)I* (cf. *eyeni* ‘peace’); Chuvash (dat.-acc.) -*nA*.

F. Chukchi-Kamchatkan: The following Proto-Chukchi-Kamchatkan absolutive suffixes may belong here as well, assuming that they are derived from the *n*-variant of the Proto-Nostratic direct object relational marker: (class 1 sg.)

-(ə)n*/*-*ŋæ*/*-*lŋən*, (class 2 sg.) *-*(ə)n*, (class 2 pl.) *-*(ə)nti* (cf. Fortescue 2005:426).

G. Etruscan: Note the accusative singular ending -*n* found in the following demonstrative stems: (archaic) *ikan* 'this', (later) *ecn*; *itan*, *itun*, *etan*, *tn* 'this' (cf. Bonfante—Bonfante 2002:92—94). Note also the accusative of the personal pronouns for 'I', *mini*, and 'you', *un* (cf. Bonfante—Bonfante 2002:91).

16.28. Genitive *-*nu* (Greenberg: §25. Genitive N; Dolgopolsky 1984:92 **nu* postpositional marker of genitive, 1994:2838 genitive **nu*, and 2008, no. 1525, **nu* (or **nü* ?) postposition and postverb 'from', postposition 'of'; Nafiqoff 2003:89—93; Fortescue 1998:103)

In Greenberg's book, this whole section is extremely powerful and well presented. Many of the same conclusions were reached by John C. Kerns in his discussion of Nostratic morphology in our joint monograph (1994:141—190, Chapter 3: "Nostratic Morphology and Syntax"). Kerns notes: "*Oblique* cases with *-*n*- stems. Though scantily attested in Dravidian and Uralic (there vestigially preserved as a stem for the personal possessive endings of nouns in oblique cases), it is better preserved in some of the other families. It is a major feature of the heteroclitic declension in Indo-European and Eskimo (J. C. Kerns 1985:109—111)."

Genitive *-*nu* developed from a particle meaning 'belonging to'. The clearest indication that this is the origin of these formations comes from Egyptian and Berber (see below).

A. Afrasian: In Egyptian, positive and relative pronouns are formed by means of a base *n*, which builds the determinative series (m. sg.) *ny*, (f.) *nyt*, (m. pl.) *nyw*, (f. pl.) *nywt*, used as genitival marker in the sense 'belonging to' (cf. Loprieno 1995:70; Gardiner 1957:66, §86; Diakonoff 1988:82) — this appears in Coptic as the genitive particle *n*- [ⲛ-] (cf. Černý 1976:102). A genitive in -*n* is found sporadically in Omotic (cf. Bender 2000:212; Zaborski 1990:621): cf. Yemsa / Janjero -*n*, -*ni*; Hamer (gen. sg. ending on possessive pronouns) -*n*. Bender considers this to be an Afrasian retention. There is a rare genitive singular marker -*ni* in Sidamo (Highland East Cushitic) and an equally rare (archaic ?) -*n* in Dasenech (East Cushitic) as well (cf. Zaborski 1990:621). A genitive *n*- also occurs in Chadic (cf. Diakonoff 1988:82). This form is found as an independent particle in Berber (cf. Kabyle *n* 'of'; Tamazight *n* 'of'; Mzab *n* 'of'). Ehret (1995:315, no. 609) reconstructs Proto-Afrasian **ni* 'of' (genitive).

B. Elamo-Dravidian: In Elamite, possession could be expressed by adding the neutral classifier -*ni*, as in *siyan Išnikarap-ni* 'Išnikarap's temple'. In Neo-Elamite and Achaemenid Elamite, the marker -*ni* coupled with the relative/ connective particle -*a* to form a new marker, -*na*. In Achaemenid Elamite, "the marker -*na* had almost completely replaced the others and functioned as a

special genitival ending" (cf. Khačikjan 1998:15). McAlpin (1981:110) reconstructs Proto-Elamo-Dravidian genitive singular (adnominal) *-*in* (< *-*i* + *-*nu*), from which he derives Proto-Elamite *-*inni* and Proto-Dravidian *-*i̲n̲*. In the following section, he also discusses the genitive -*na* found in Achaemenid Elamite. Krishnamurti (2003:221—224) reconstructs a Proto-Dravidian oblique marker *-*an*/*-*in*, *-*nV* > Old Tamil -*a̲n̲* (used with demonstrative pronouns, quantifiers, and numerals), -*i̲n̲* (after disyllabic and trisyllabic stems ending in -*a*, -*ā*, -*u*, -*ū*, -*ē*, and -*ai* in the instrumental, dative, and occasionally sociative cases), -*in* by itself was genitive; Malayalam had -*an* as an augment of demonstratives in early inscriptions — otherwise, -*in* had the same distribution as -*i̲n̲* in Old Tamil, while stems ending in -*tt*- add -*in*- also in the dative and genitive; Iruḷa -*(a)n* occurs as an augment with animate nouns, including the personal pronouns before instrumental; Koḍagu -*ïn*/-*n* are used as augments after neuter demonstrative pronouns in the accusative, dative, and genitive cases; Kota -*n* after neuter demonstratives; Toda -*n* added in adnominal use of some noun stems; Kannaḍa -*ar* (a sandhi variant of -*an*) became generalized as the oblique marker of neuter demonstratives in the singular and plural and in numerals; Tuḷu -*n* augment after human nouns and after stems ending in -*e*; Telugu -*an*-*i* oblique augment in demonstrative neuter forms, singular and plural; Gondi -*n* augment after masculine nouns ending in a vowel; Pengo -*n* genitive plural of non-human nouns ending in -*ku*; Koṇḍa -*an*-*i* (< -*an*+-*i*) in neuter demonstrative forms; Kuwi -*n*/-*na* augment of nouns referring to humans; Maṇḍa -*n*- oblique-genitive; Naiki (of Chanda) -*n* in animate nouns in some of the cases; Parji -*n* oblique marker of some stems in ablative and genitive cases; Gadba -*n*/-*in*/-*un* genitive marker; Kuṛux -*in*/-*i* after non-masculine singular demonstrative stems before all cases. It is worth repeating that the ending -*in* by itself was genitive in Old Tamil and that it could be used syntactically as an adnominal. Indeed, *n*-endings occur in genitive forms in several Dravidian languages (cf. Zvelebil 1977:31; for examples, see above).

C. Indo-European: Greenberg (2000:130 and 131—132) rightly notes that "oblique-*n*" shows up in the oblique cases of the heteroclitic -*r*/-*n* stems in Indo-European (for details about heteroclitic stems, cf. Benveniste 1935:100—120; Szemerényi 1996:173—174; Beekes 1995:187; Meillet 1964:266; Burrow 1973:127—130). A good illustration of the patterning can be found in Sanskrit (nom. sg.) *ásṛk* 'blood' (cf. Hittite nom.-acc. sg. *e-eš-ḫar* 'blood', Tocharian A *ysār* 'blood', Greek ἔαρ 'blood', Latin *assir* 'blood') versus (gen. sg.) *asnás* (cf. Hittite gen. sg. *e-eš-ḫa-na-aš*, *e-eš-na-aš*) (the nom. sg. in Sanskrit contains a secondary suffix). There is also important evidence elsewhere within Indo-European. For example, it appears in the genitive of the first person singular personal pronoun **me-ne* > Avestan *mana*; Old Church Slavic *mene*; Lithuanian *manęs* (cf. Szemerényi 1996:214). In Slavic, it is found in all of the oblique cases of the first person singular personal pronoun, not just the genitive (note the table in Szemerényi 1996:212). Finally, Greenberg (2000:132) convincingly claims that the large and important class of *n*-stems arose through the spread of the oblique-*n* to the nominative, at least in Greek, which always

has -v. In Latin, this type is found, for example, in *homō* ‘human being, person, man’, (gen. sg.) *hominis* (for a detailed discussion of this stem, cf. Ernout—Meillet 1979:297—298).

D. Uralic: The genitive ending in Proto-Uralic was *-*n* > Finnish *kalan* (*kala* ‘fish’); Lapp / Saami *guolen* (*guole* ‘fish’); Cheremis / Mari *kolõn* (*kol* ‘fish’); Selkup Samoyed (Ket) *logan* (*loga* ‘fox’); Kamassian *d'agan* (*d'aga* ‘river’); Tavgi Samoyed / Nganasan *kindaŋ* (*-ŋ* < *-*n*) (*kinta* ‘smoke’) (cf. Abondolo 1998a:19—20; Collinder 1960:282—284; Greenberg 2000:130 and 133; Raun 1988b:558—559; Sinor 1988:715). Marcantonio (2002:284) notes: “The Genitive *-n* within U[ralic] is present in Finnish, Cheremis, Lapp, Mordvin, and Samoyed Selkup.”

E. Altaic: Poppe (1955:187) reconstructs the Common Altaic genitive suffix as *-*n* > Korean *-*n*, Tungus *-*ŋī* (< *-*n* + the ending *-*gi* < *-*ki*); Ancient Turkic *-ŋ* (< *-*n*). Poppe notes that, after stems ending in a vowel, *-*n* was used, but, after stems ending in a consonant, a connective vowel was inserted before the *n*: **C-Vn*, which appears as *-*ï-ŋ*/*-*i-ŋ* in Turkic, as either *-*u-n* or *-*ï-n*/*-*i-n* in Pre-Mongolian, and as *-*ạń* or *-*ïn* in Korean. Several important changes occurred in Pre-Mongolian. In Pre-Mongolian, the ending *-*ï-n*/*-*i-n* was generalized, and the inherited post-vocalic form, *-*n*, was replaced by *-*ï-n*. Additional changes occurred in Common Mongolian. First, the final *-*n* of the genitive ending was lost in stems ending in **n*: **n-Vn* > **n-V*. With the replacement of the post-vocalic genitive *-*n* by *-*ï-n*, the hiatus between the final vowel of the stem and the genitive suffix was filled with the consonant *-j-*: *-*V-n* > *-*V-ïn* > **V-j-ïn*. See Poppe (1955:189—194) for details concerning the developments in the individual Mongolian daughter languages. Examples of the genitive in Mongolian: *ger-ün* (*ger* ‘house’), *eke-yin* (*eke* ‘mother’), *köbegün-ü* (*köbegün* ‘son’), *bars-un* (*bars* ‘tiger’), *aqa-yin* (*aqa* ‘older brother’), *qaγan-u* (*qaγan* ‘king’). Note here also the genitive marker *-nu* found in the Mongolian obsolete pronouns *anu* and *inu*. Róna-Tas (1998:73) reconstructs a Proto-Turkic genitive *-*n* > Ottoman Turkish *oqïnïŋ* ‘of his arrow’ (later *oqïn*); Turkish (sg.) *taşın* (*taş* ‘stone’), (pl.) *taşların*; Azerbaijani *ėvin* (*ėv* ‘house’), *oχun* (*oχ* ‘arrow), *atanïn* (*ata* ‘father’); Turkmenian genitive singular suffix (after vowels) *-nIŋ*, (after consonants) *-Iŋ*; Tatar (and Bashkir) genitive singular suffix *-nĔŋ*; Kirghiz genitive singular suffix *-Nin*; Uighur *balaniŋ* (*bala* ‘child’), *kölniŋ* (*köl* ‘lake’), *qušniŋ* (*quš* ‘bird’); *yurtiniŋ* (*yurti* ‘house’), *tügmilirimniŋ* (*tügmilirim* ‘my buttons’); Uzbek genitive singular suffix *-niŋ*; Chuvash genitive singular suffix *-(n)ăn*/*-nĕn*. Róna-Tas (1998:73) also mentions that an oblique marker in *-*n* has left traces in four cases in Proto-Turkic: genitive *-*n*, accusative *-*nVG* (*-*nI* in pronouns), dative *-*nKA*, and instrumental *-*nVn*. Greenberg (2000:135) notes that “[i]n South Tungus there is a large class of nouns in which *-n* occurs in the oblique cases, but not in the nominative or accusative. In North Tungus the *-n* has apparently been extended through the whole paradigm…” According to Greenberg (2000:135), the only remnant of an *n*-genitive is found in pronouns in North Tungus — Greenberg cites an example from Negidal (*min*, *minŋi* ‘my’ versus nominative

bi ‘I’). However, note the Manchu genitive particle *-ni*, used after words ending in *-ŋ*. Cf. Sinor (1988:715) for an excellent sketch of *n*-genitive forms in Uralic and Altaic, and Greenberg (2000:133—135) for additional discussion of the Altaic data. Starostin—Dybo—Mudrak (2003:221) reconstruct a Proto-Altaic genitive suffix **-ńV* on the basis of: Proto-Tungus **-ŋi* (< **-ń-ki*); Old Japanese *-no*; Korean *-ń*; Proto-Mongolian **-n*; Old Turkic *-ŋ* (< **-ń-ki*).

F. Chukchi-Kamchatkan: Note the following Proto-Chukchi-Kamchatkan attributive suffixes: (class 1 sg.) **-nu*, (class 2 sg.) **-(ə)nu*, (class 2 pl.) **-(ə)ðɣənu* (cf. Fortescue 2005:426 and fn. 10). Also note the Proto-Chukchi-Kamchatkan possessive suffix **-inæ* ‘pertaining to’: Chukchi *-in(e)* ‘pertaining to’ (possessive adjective formant of human possessors), *-nin(e)* on personal pronouns and optionally on proper names (pl. *-ɣin(e)*); Kerek possessive suffix *-in(a)*; Koryak possessive suffix *-in(e)* ‘pertaining to’ (also *-nin(e)* on personal pronouns and optionally vowel-final proper names); Alyutor possessive suffix *-in(a)* ‘pertaining to’; Kamchadal / Itelmen possessive suffix *-n*, *-ʔin*, *-ʔan* ‘pertaining to’. Cf. Fortescue 2005:409.

G. Etruscan: In Etruscan, in addition to the regular genitive endings in *-s*, there is an archaic genitive in *-n* (*-an*, *-un*): cf. *lautn* ‘family’, (genitive) *lautun* or *lautn*; *puia* ‘wife’, (genitive) *puian*.

Sumerian: In Sumerian, there is an asyntactical construction *nu*+NOUN used mainly to form terms for professions. As noted by Thomsen (1987:55), the “exact character of /nu/ is not evident”. However, we can offer a guess that *nu* may originally have been an independent particle meaning ‘belonging to’, which is preserved only in the above construction. That this guess is not far off the mark is indicated by Thomsen’s (1987:56) comment that: “[t]he constructions with nu- are normally asyntactic, only in one case: nu.$^{\tilde{g}iš}$kiri$_6$, it seems to be a genitive construction; cf. for instance nu.$^{\tilde{g}iš}$kiri$_6$-ke$_4$ (ergative) in *NG* nr. 120b, 4 (see Edzard, 1963, p. 92f.).”

16.29. Locative **-ni* (Greenberg: §30. Locative N; Illič-Svityč 1971—1984.II: 78—81, no. 314, **-n* suffix of oblique form of nouns and pronouns)

In his book on Eurasiatic morphology, Greenberg treats the different cases based on this suffix separately. Indeed, despite their similarity in form, the locative **-n* and genitive **-n* developed from two separate formants:

The origin of the locative marker **-ni* may have been as follows: Evidence from Afrasian and Indo-European supports reconstructing an independent particle **ʔin-* (~ **ʔen-*), **(-)ni* meaning ‘in, within, into’ (from Afrasian, cf. Akkadian *ina* ‘in, on, from, by’; Egyptian *ỉn* ‘in, to, for, because, by’; from Indo-European, cf. Greek ἐν, ἔνι, ἐνί ‘in, on, among, into, and, besides, moreover’, Latin *in* ‘in, on, among, into, on to, towards, against’, Gothic *in* ‘in’). Originally, **ʔin-* (~ **ʔen-*) meant ‘place, location’ (cf. Dolgopolsky 2008, no. 45, **ʔinⁿ[A]* ‘place’). When this particle was

used in conjunction with nominal stems, it indicated the place in, on, or at which something existed or occurred: NOUN+*ni*. From there, it developed into a full-fledged case form with locative, inessive, or adessive meanings. At a later date, *-*n* became generalized as the oblique marker *par excellence*. Greenberg (2000:130) is thus correct in noting the wider use of -*n* as a marker of the oblique case.

To complicate matters, there may have been yet a third form involved, namely, a (lative-)dative *-*na*. The evidence for this comes mainly from Samoyed (cf. Collinder 1960:293—294), from Vogul, where the lative-dative endings are -*(ə)n*, -*na* ~ -*nä* (cf. Marcantonio 2002:208), and several Afrasian languages. The forms in Nostratic thus appears to have been similar to what is found in Sumerian, which has a locative prefix -*ni*- and a dative prefix -*na*-. The original patterning has been reversed in Uralic (except for Samoyed and Vogul, as just indicated).

A. Afrasian: In Highland East Cushitic, we find the following: In Gedeo / Darasa, the ablative-locative ('from, in, at') suffix is -*'ni*, and the instrumental suffix is -*nni*, while in Hadiyya and Kambata the locative-instrumental suffix is -*n* (cf. Hudson 1976:253 and 2007:540). In Sidamo, on the other hand, there is a multipurpose postposition -*nni* with the meanings 'from, at, on, by, with' (cf. Hudson 1976:254). In Omotic, there is a widespread instrumental-locative-directional marker -*nV* (cf. Zaborski 1990:626—627) — Zaborski lists the following examples from various Omotic daughter languages: Koyra -*na*, -*una* (after consonants); Zayse -*n* and the postposition -*unna* ~ -*nna* 'with, by means of' used in an instrumental function: *kallónna* (*kalló* 'stick'), *súgénna* (*súge* 'rope'), *súusù̲nna* (*súusù* 'blood'); Ometo -*n*; Welamo -*n*; Kullo -*n*; Chara -*in*, -*ina*; Shinasha -*n(i)*; Kefa -*nā*. Also note the following locative markers: Gofa -*n*; Basketo -*n*; Gemu -*n*; Zala -*n* (cf. Bender 2000:24). Zaborski (1990:627) further notes that some of the Omotic forms may be borrowed from Highland East Cushitic. Bender (2000:212) notes that a locative in -*n* is widespread in the Macro-Ometo branch of Omotic. Ehret (1980:185) reconstructs Proto-Southern Cushitic **nee* 'with, and; by [agent]' > Iraqw *ne* 'with, and; by'; Burunge *ne* 'with, and; by'; Alagwa *ne* 'with, and; by'; Ma'a *ní* 'by [agent]', *ne*- in *neri* 'until'. For Proto-Afrasian, Ehret (1995:315, no. 608) reconstructs **ne(e)* 'with'.
B. Dravidian: As noted by Zvelebil (1977:32, §1.1.3.5.6): "*-*in*/*-*il* may probably be reconstructed as the underlying shape of a number of related forms which are markers of a locative function": Old Tamil -*il*/-*i̲n* as in *maruk-i̲n* 'in the street', *irav-i̲n* 'at night', *cilamp-il* 'in the mountain'; Old Telugu -*a(n)* as in *cēt-an* 'in hand', *iṇṭ-an* 'in the house'; Koṇḍa -*ŋ* locative marker in the plural oblique of stems in -*a*; Naiki (of Chanda) -*in* as in *kuḍḍ-in* 'on the wall', -*un* as in *ūr-un* 'in the village'; Gadba -*in* as in *māre-t-in* 'in a tree', -*un* as in *polub-t-un* 'into the village'; Kuṛux and Malto locative marker -*nū*. The first member of the pair reconstructed by Zvelebil, namely, *-*in*, may be compared with the locative forms in -*n*- found elsewhere in Nostratic. Cf. also Krishnamurti 2003:238—243. Note also the Proto-Dravidian oblique markers *-*an*/*-*in*,

*-*nV* (cf. Krishnamurti 2003:221—224); oblique marker in non-human demonstrative pronouns in South Dravidian *-*an* (cf. Krishnamurti 2003:222—223).

C. Kartvelian: Proto-Kartvelian *-*n* suffix of oblique form of nouns and pronouns. Cf., for example, the following forms of Svan *ala* 'this': (instr. sg.) *am-n-oš*, (adverbial) *am-n-är-d*, (erg.) *am-n-ēm-(d)*, (gen. sg.) *am-n-ēm-iš* (cf. Tuite 1997:15; Gudjedjiani—Palmaitis 1986:46).

D. Indo-European: Greenberg (2000:150) also considers various evidence in Indo-European for a locative ending in *-*n*. The most convincing evidence he cites is the Vedic pronominal locatives *asmín* 'in that', *tásmin* 'in this', and *kásmin* 'in whom?'. In these examples, the pronoun stem has been enlarged by an element *-sm(a)-*, to which a locative ending *-in* has been added. Since the final *-n* is missing in the cognate forms in Iranian, Burrow (1973:271) considers this to be a secondary formation, unique to Sanskrit. However, as Greenberg rightly points out, the Vedic forms can be compared with Greek pronominal datives in –ι(ν) such as Lesbian ἄμμιν, ἄμμι 'to us' (cf. Buck 1933:219 and 1955:98; Sihler 1995:380). Thus, we may be dealing here with relic forms. Benveniste (1935:87—99) explores in great detail locative forms in *-n* in Indo-European — he (1935:88) cites the following examples from Sanskrit: *jmán*, *kṣāmán* 'in the earth', *áhan* 'on [this/that] day', *udán* 'in the water', *patan* 'in flight', *āsán* 'in the mouth', *śīrṣán* 'in the head', *hemán* 'in winter', *akṣán* 'in the eye'.

E. Uralic-Yukaghir: Collinder (1960:286—287) reconstructs a Proto-Uralic locative(-essive) *-*na* ~ *-*nä*, while Abondolo (1998a:20) reconstructs a Proto-Uralic locative marker *-*nA*. According to Collinder, the locative(-essive) is best preserved in Finnish (where it now functions mostly as an essive), Eastern Ostyak / Xanty, and Yurak Samoyed / Nenets: Finnish and Eastern Ostyak / Xanty *-na* ~ *-nä*, Yurak Samoyed / Nenets *-na* ~ *-ne*. Tavgi Samoyed / Nganasan has *-nu* (< *-*na*) and *-ne*, *-ni*, without regard to the quality of the vowel of the first syllable. Northern Ostyak / Xanty has *-na* or (in some dialects) *-n*. Cheremis / Mari has *-nõ*, *-nə* (with or without vowel harmony; in the easternmost dialects *-no*, *-nõ*, *-ne*). Lapp / Saami has *-nne*, *-nnĕ* after a monosyllabic stem, *-n* (Southern Lapp / Saami *-nĕ*) in other positions. The Permian languages and Hungarian have *-n*. Marcantonio (2002:284) notes: "The locative I *-n(V)* is found in the majority of the U[ralic] languages (but not in Vogul), in more or less productive functions." Note also the Proto-Yukaghir locative/lative affix *-*n(ə)* (> Northern / Tundra *-n(ə)*) (cf. Nikolaeva 2006:82).

F. Chukchi-Kamchatkan: Chukchi locative *-ne* (recessive) (cf. Comrie [ed.] 1981: 246). Proto-Chukchi-Kamchatkan derivational affix *-*nv(ə)* 'place of -ing' (cf. Fortescue 2005:417—418).

G. Gilyak / Nivkh: Amur has the locative markers *-uine*/*-uin*/*-in*/*-un*/*-n* (cf. Gruzdeva 1998:18 [table of case markers] and 19). Nominal stems ending in a consonant form locatives by adding the *-uin* variant, while those ending in a vowel other than *-i* add the *-in* or *-un* variant; stems ending in *-i* add *-n*.

H. Eskimo: Proto-Eskimo locative (plural) *-*ni*, (dual) *-*ɣni* (cf. Fortescue—Jacobson—Kaplan 1994:442; Greenberg 2000:152).

Sumerian: Note the locative dimensional prefix *-ni-* (cf. Thomsen 1987:99 and 234—240; Hayes 1997a:22).

16.30. Dative *-*na* (not in Greenberg 2000)

The evidence for this formant is spotty.

A. Afrasian: In Egyptian, "[t]he meaning of the dative is rendered by means of the preposition *n* … 'to', 'for'" (cf. Gardiner 1957:48, §52; also Hannig 1995: 385—386); Coptic *n-* [ⲛ-], *na-* [ⲛⲁ-] dative preposition. In Hadiyya (Highland East Cushitic), the dative is indicated with a suffixed *-n* (cf. Hudson 1976:252). Bender (2000:212) points out that, in Omotic, "[t]here are two other widespread datives: *r* in single languages… and *n*…" (cf. Dime *-in*).
B. Dravidian: Krishnamurti (2003:230—233) reconstructs the Proto-Dravidian dative as *-*nkk*-, but he points out that the "geminate consonant cluster *-*kk*- is the core of the dative suffix". We may be dealing here with a hyper-characterized suffix, combining a relic of *-*n* dative plus *-*kk*- (on which, see below).
C. Indo-European: Perhaps preserved in the adverbial suffix found, for example, in Latin *superne* 'to a higher level, above'; Gothic *ūtana* 'from without'; etc.
D. Uralic: In Samoyed, the lative-dative case is built upon *-*n* (cf. Collinder 1960:293—294; Hajdú 1968:65). Examples: Yurak Samoyed / Nenets *ŋudan* (*ŋuda* 'hand'); Selkup Samoyed *hajond* (*haj* 'eye'); Kamassian *d'agane* (*d'aga* 'river'). Künnap (1984:287) reconstructs a Proto-Samoyed lative (absolute declension) *-*ntV*. He also notes that, at a minimum, the following local case endings existed in Proto-Samoyed: lative *-*ŋ*, locative *-*n*, ablative *-*tV*, and prospective *-*mVnV*. According to Marcantonio (2002:285): "The existence of P[roto]-U[ralic] Lative/Dative I *-*ń* ~ *-*n*, or perhaps *-*ŋ* …, is not widely accepted, because its reflexes are to be found only in the Vogul Lative *-*n(V)* and in Mordvin, where it has a Dative/Allative function (Zaicz 1998: 192). Possible reflexes are to be found in adverbial forms such as Finn. *kohde-n* 'towards' and in Samoyed, for which compare the reconstructed Samoyed Dative *-*ng* in Table 8.6. It is present in Yukaghir; see again Table 8.6." In Vogul, the lative-dative endings are *-(ə)n*, *-na* ~ *-nä* (cf. Marcantonio 2002: 208).
E. Altaic: Starostin—Dybo—Mudrak (2003:221) reconstruct a Proto-Altaic dative/instrumental suffix *-*nV* on the basis of: Old Japanese dative/locative *-ni*; Old Turkic instrumental *-(ï)n*/*-(i)n*.

Sumerian: The (3rd sg. animate) dative dimensional prefix is *-na-* (cf. Thomsen 1987:220; Hayes 1997a:22).

16.31. Directive *-*kʰa* (Greenberg: §26. Dative KA; Illič-Svityč 1971—1984.I: 368—369, no. 245, *Ḳʌ directive particle; Nafiqoff 2003:102 Proto-Altaic

*-*ka*/*-*kä* lative-dative formant; Dolgopolsky 2008, no. 983, *$\underline{*}$*ḴV* [= *$\underline{*}$*ḳV* ?] ‘towards’ directive particle)

This formant appears to be derived from an old particle *k^ha meaning ‘direction to or towards; motion to or towards’.

A. Afrasian: According to Bender (2000:212), there is some evidence in several Omotic languages for a dative(-locative) *-*kVn*. In Northwest Ometo, we find the following suffixes indicating ‘motion to or toward’: Welaitta -*(k)ko*; Gofa -*ko*; Gemu -*ko* (?) (cf. Bender 2000:24). Note also the Ongota locative suffix -*ka*/-*ke*/-*ki* (cf. Fleming 2002b:40).
B. Elamo-Dravidian: The Proto-Dravidian dative is reconstructed as *-*nkk*- by Krishnamurti (2003:230—233) but as *-*(k)ku* by Zvelebil (1977:31): cf. Tamil -*kku*; Malayalam -*kku*; Kota and Toda -*k*; Iruḷa -*(u)kku*, -*kke*; Kannaḍa -*(k)ke* (after stems ending in -*a* and after pronouns which take -*ar* as the augment), -*(g)ge* (elsewhere); Koḍagu -*gï* (after stems ending in a nasal), -*kï* (elsewhere); Baḍaga -*ga*; Tuḷu -*ku*/-*kï*/-*gi*; Telugu -*ki(n)* (after stems ending in -*i*), -*ku(n)* (elsewhere); Gondi -*k*; Kui -*gi*; Kuwi -*ki*; Northern Parji -*g*/-*gi*; Kuṛux -*gē*; Malto -*k*/-*ik*. Krishnamurti considers the -*n*- as originally part of this formant and that it was dropped in South Dravidian. As in Turkic (see below), *-*nkk*- may be a compound suffix in which *-*kk*- has been added to dative-*n* (on which, see above). For Proto-Elamo-Dravidian, McAlpin (1981:109—110) reconstructs an adessive ending *-*əkkə*, which developed into the dative in Dravidian. In Elamite, *-*əkkə* developed into the superessive ending -*ukku* (‘on, in, according to’) (cf. Paper 1955:81), on the one hand, and into the directive-allative ending -*ikki* (‘to, towards, into’) (cf. Paper 1955:77—78), on the other.
C. Kartvelian: In Svan, there is a nominal postposition -*ka* with the meaning ‘out, through’, also found in the compound -*xānka* with the meaning ‘out of’. When used as a verb prefix, *ka* indicates outward direction. There may have been a semantic shift from ‘direction to or towards’ to ‘direction out from or away from’. If so, the Svan forms can be compared with those under discussion here.
D. Uralic: Collinder (1960:296) notes that a lative *k + a vowel is to be reconstructed for Proto-Uralic. Abondolo (1998a:18) reconstructs lative *k. Cf. also Sinor 1988:719. According to Künnap (1984:287—291), in Proto-Samoyed, this form serves as the basis for the lative, locative, and ablative case endings: (a) absolutive declension: (locative) *-*kVnV*, (ablative) *-*kVtV*; (b) possessive declension: (lative) *-*kV*, (locative) *-*kVnV*, (ablative) *-*kVtV*. Clearly, the lative *-*kV* found in the possessive declension is the oldest form. The locative and ablative endings are compound forms, consisting of the base form *-*kV* + *-*nV* and *-*kV* + *-*tV*, respectively. Künnap also notes that, at a minimum, the following local case endings existed in Proto-Samoyed: lative *-*ŋ*, locative *-*n*, ablative *-*tV*, and prospective *-*mVnV*. Marcantonio (2002:286) notes: “The Lative II *-*k(V)* is supposed to have developed in most languages into spirants (-*γ*, -*χ*, -*w*) or into vowels, as in Hun. *fel-é* ‘towards’, *id-e* ‘toward here’, according to traditional, but not widely accepted, analysis

(Raun 1988b: 560; Hajdú 1988a: 280). It is preserved as such in a few languages, such as Ingrian *ala-k* '[towards] under'. Traces of this ending can be found in Lapp (Korhonen 1988a: 280). There is in Mordvin a Prolative *-ka* (Raun 1988a: 101), which could be a reflex of Lative II **-k(V)*."

E. Altaic: Greenberg (2000:137) reconstructs a Proto-Turkic dative-allative **-ka*, while Róna-Tas (1998:73) reconstructs a dative **-nKA*. As noted by Róna-Tas, **-nKA* is a compound suffix in which **-KA* has been added to oblique-*n*. Sinor (1988:719) notes that the Common Turkic dative is *-qa*, *-ka*, *-γa*, *-ge*. Turkic examples: Middle Kipchak *-GA* (cf. *yolγa* 'for the road', *toyγa* 'for the feast', *qarabusqa* 'to the saddle-bow'); Chagatay *-γa*, *-ge* (but mostly *-qa*, *-ke* after voiceless consonants); Tatar *-GA* (cf. *atqa* 'to the horse', *etige* 'to the father', *urmanγa* 'to the forest'); Kazakh *-GA*; Noghay *-GA* (cf. *balaγa* 'to the child', *terekke* 'to the tree', *qoyanγa* 'to the hare', [pl.] *atlarγa* 'to the horses'); Kirghiz *-GA*; Uighur *-GA* (cf. *töpige* 'to the peak', *taγiγa* 'to the uncle', *közge* 'to the eye', *qizγa* 'to the girl', *sayγa* 'to the river gorge', *seyge* 'to the vegetable', *χunenge* 'to Hunan', *šenduŋγa* 'to Shandong', *terepke* 'to the side', *tetqiqatqa* 'to [the] research'); Uzbek *-Gȧ*; Yakut *-GA* (cf. *eyeγe* 'to peace', *uokka* 'to the fire', *oχko* 'to the arrow'). Greenberg (2000:137—138), notes that "[i]n Tungusic, *-k-* occurs as a case marker only with coaffixes, e.g. Evenki *-k-la* (lative)…", while Sinor (1988:719) notes the same usage and also compares the Tungus directive suffix *-ki*, *-xi* found at the end of postpositions and adverbs. Starostin—Dybo—Mudrak (2003:221) reconstruct a Proto-Altaic dative/directive suffix **-k'V* on the basis of: Proto-Tungus directive **kī* and Old Turkic dative *-qa*/*-ke*.

F. Chukchi-Kamchatkan: The Proto-Nostratic directive marker **-kʰa* may have been the source of the following Proto-Chukchi-Kamchatkan locative suffixes: (class 1 sg.) **-(ə)k*, (class 2 sg.) **-(a)næk*, (class 2 pl.) **-(ə)ðək* (cf. Fortescue 2005:426).

G. Gilyak / Nivkh: According to Gruzdeva (1998:18), the (Amur and East Sakhalin) dative-accusative case markers are *-aχ*, *-χ* (see also Greenberg 2000:138), and the dative-additive case markers are *-toχ*/*-roχ*/*-doχ*/*-rχ*/*-tχ*.

H. Eskimo: Proto-Inuit postbase **q-* 'go (to)' (added to allative case of [adverbial] demonstrative bases) (cf. Fortescue—Jacobson—Kaplan 1994:421).

16.32. Locative **-ma* and locative **-bi* (Greenberg: §27. Locative M, and §28. Locative BH)

These two forms will be discussed together. The locative function ascribed to these forms by Greenberg is clearly a later development. At the Proto-Nostratic level, we are dealing with independent particles.

I did not reconstruct a Proto-Nostratic ancestor for Proto-Indo-European **me-*/**mo-* 'with, along with, together with' in my 1994 joint monograph — perhaps I should have looked a little more diligently. Given all of the considerations discussed

below, I would now reconstruct a Proto-Nostratic **ma* (~ **mə-*) — as in Egyptian, it was used to indicate position and had a similar range of meanings, that is, 'in; from; with'. I propose that it was this stem that was the source of the locative forms Greenberg discusses. In Indo-European (and Etruscan), the instrumental- comitative sense prevailed, while elsewhere in Eurasiatic, the locative sense was emphasized.

In my joint monograph with John C. Kerns (1994:218—219, no. 23), I reconstruct Proto-Nostratic **bi* (~ **be*) 'in addition to, with, together with' on the basis of the Indo-European material discussed below plus Afrasian **bi* 'in, with, within, among' and Sumerian *bi* 'with, together with, in addition to'. In Sumerian, this stem is also used as a conjunction: *-bi*, *bi-da*, *-bi-(da)* (literally, 'with its...') "...used in the sense 'and' with nouns and without the disjunctive force of *ù*" (quote from Thomsen 1987:84).

A. Afrasian: In Egyptian, we find *m* (preposition, with suffixes) 'in; with, by means of; from, out of; as, namely'. Note Gardiner (1957:124—125, §162): "...*m*, before suffixes...*i̯m·*, indicates *position* generally, the main lines of development being 'in', 'from', and the instrumental 'with'." Note also the following forms from Semitic: Ugaritic *ʿm* (= *ʿamma* ?) 'with, to' (also *ʿmn*); Hebrew *ʿim(m-)* 'with, together with'; Syriac *ʿam* 'with'; Aramaic *ʿim(m-)* 'with'; Arabic *maʾa* 'with, together with, accompanied by, in the company of', *maʾan* 'together, at the same time, simultaneously'. A locative ending **-u(m)* can be reconstructed for Proto-Semitic as well. Also worth noting are Hadiyya (East Cushitic) *-m* 'too, also' and Hausa (Chadic) *ma* 'also, too, even'. Ongota has an agentive/instrumental noun suffix *-mi*/*-me* (cf. Fleming 2002b:40). For Proto-Afrasian, Diakonoff (1988:61) reconstructs a locative-adverbialis **Vm*.

   Proto-Nostratic **bi* 'in addition to, with, together with' is particularly well represented in Semitic: Proto-Semitic **ba* ~ **bi* 'in, with, within, among' > Hebrew *bə-* 'in, at, on, with'; Arabic *bi* 'in, within, among'; Ugaritic *b* 'in, with, from'; Sabaean *b* 'from, of, in, on, at'; Śḥeri / Jibbāli *b-* 'at, about, by, with, in'; Ḥarsūsi *b(e)-* 'in, with, by'; Geez / Ethiopic *ba* 'in, at, into, on, by, through, with (by means of), after (kind and means), by reason of, because of, out of, on account of, according to, concerning, against (contiguity)'; Gurage *bä* 'with, in, at, by, out, out of, from'; Harari *-be* 'with, from, by, of, in, on, at'. It is also found in Beja / Beḍawye (postposition) *-b* 'by, in, of'.

B. Elamo-Dravidian: Note the Elamite locative affix (postposition) *-ma* 'in' (cf. Paper 1955:79—81), variant *-me* (there is also a genitive affix *-ma*, variants *-mi* and *-me*). McAlpin (1981:68, table 2.1) lists the Elamite postposition *-ma* 'in, on; according to', used with things and time units and indicating location inherent in place names. Krishnamurti (2003:413—415) reconstructs a Proto-Dravidian coordinating formant **-um*. In Modern Tamil, *-um* has several meanings: (a) 'also', (b) 'totality', (c) 'any/none' (when added to interrogative words, depending on the positive or negative governing verb), (d) 'and' (when added to each of the coordinating phrases), and (e) 'even, although' (when added to a conditional phrase). Similar usage is found in Malayalam (cf., in the

sense ‘also’: *avan roṭṭi tinnu; veḷḷavum kuṭiccu* ‘he ate the bread; he drank the water *also*’; in the sense ‘and’: *rāghavan-um kumār-um vannu* ‘Raghavan *and* Kumar came’; in the sense ‘always’: *avar eppōẓ-um vāyiccu-koṇṭ-irukk-unnu* ‘they are *always* reading’). In Old Kannaḍa, *-um* means ‘and’ or ‘even, also’ (cf., in the sense ‘and’: *iḍ-ut-um…ār-ut-um…mung-ut-um* ‘hitting, shouting, and swallowing’, *tāy-um tande.y-um* ‘mother and father’; in the sense ‘even, also’: *nuḍiyey-um* ‘even after saying’, *ad-um* ‘that also’). In Elamite, the locative sense is dominant, while in Dravidian, the conjunctive-comitative sense prevailed.

C. Indo-European: Two separate stems must be reconstructed for Proto-Indo-European, namely, (1) **me-/*mo-* and (2) **b^hi-*, just as Greenberg indicates. Pinning down the exact meaning of each is not easy, however. In Germanic, the primary meaning of the derivatives of the first stem is ‘with, among’: cf. Gothic *miþ* ‘with, among’; Old English *mid*, *miþ* ‘together with, with, among’; Middle High German *mite*, *mit* ‘with, by, together’; Old Icelandic *með* ‘with, along with, together with’. Greek μετά means ‘(with gen.) in the midst of, among; (with dat.) among, in the company of; (with acc.) into the middle of, coming among’. The original meaning seems to have had to do with ‘accompaniment, conjoinment’, that is, ‘with, along with, together with’, as in Old Icelandic. In other words, a stem is involved that is more instrumental or comitative in meaning than locative, at least in Indo-European. As Greenberg notes, the use of this stem as an inflectional ending is restricted to Germanic, Slavic, and Baltic. As Greenberg points out in §28, the stem **b^hi-* also exists as an independent stem in Germanic: cf. Gothic *bi* ‘about, over; concerning, according to; at’; Old English *be*, *bi*; *bī* (preposition, with dat., indicating place and motion) ‘by (nearness), along, in’; Old High German *bi-*; *bī* adverb indicating nearness, preposition meaning (with dat.) ‘(near) by, at, with’, as adverb ‘from now on [von jetzt an]’. The original meaning, based upon the Germanic evidence, seems to have had to do with ‘proximity, nearness’, either of place ‘(near) by, at’ or time ‘now, at the present time’. There is a compound in Sanskrit, namely, *abhí* (either < **e-/o-+b^hi-* or **m̥-+b^hi-*), whose primary meaning is ‘moving or going towards, approaching’ — as an independent adverb or preposition, it means (with acc.) ‘to, towards, in the direction of, against, into’; as a prefix, it means ‘to, towards, into, over, upon’. Another compound is found in Greek ἀμφί (**m̥-+b^hi-*), preposition used with the genitive, dative, and accusative with the basic meaning ‘on both sides’, as opposed to περί, whose basic meaning is ‘all around’ — (with gen., causal) ‘about, for, for the sake of’, (of place) ‘about, around’; (with dat., of place) ‘on both sides of, about’; (with acc., of place) ‘about, around’; (as independent adverb) ‘on both sides, about, around’. This compound is also found in the Latin inseparable prefix *amb-*, *ambi-*, meaning ‘on both sides; around, round about’. Further relationship to words meaning ‘both’ is usually assumed, though uncertain. When we look at the use of **-b^hi-* as a case ending, we find a slightly different semantic range than what is indicated by the above evidence. I think it is significant that it is specifically this ending that shows up in the

instrumental singular in Greek and Armenian. This seems to indicate that the original meaning was similar to **me-/*mo-*, that is, 'with, along with, together with'. Indeed the choice between **-me-/*-mo-* as a case ending in Germanic, Baltic, and Slavic, on the one hand, and **-b^hi-* as a case ending in Italic, Indo-Iranian, Greek, and Armenian, on the other, seems to indicate that they were close, if not identical, in meaning. Considering this, it appears to me that the Germanic meanings are secondary. Thus, we can reconstruct two separate stems for Proto-Indo-European, the first of which, **me-/*mo-*, meant 'with, along with, together with', the second of which, **b^hi-*, meant (on the basis of its use in case endings) 'in, with, within, among'. The evidence from Afrasian and Sumerian mentioned above reinforces the interpretation that the original meaning of Proto-Indo-European **b^hi-* was 'in, with, within, among'.

D. Altaic: In Tungus, *-mi* appears as a locative-instrumental adverbial suffix, as in Orok *gitu-mi* 'on foot, by foot' (cf. Greenberg 2000:141).

E. Chukchi-Kamchatkan: Chukchi comitative suffix *-ma* (cf. Comrie [ed.] 1981:245; Fortescue 2005:426 and fn. 9).

F. Eskimo-Aleut: Proto-Eskimo postbase **mi-* 'and then, again' > Central Alaskan Yupik *+mi* 'also'; Seward Peninsula Inuit *+(p)mi* 'even though'; North Alaskan Inuit *+(m)mi-* 'also'; Western Canadian Inuit *+(m)mi* 'again, too, and then'; Eastern Canadian Inuit *+(m)mi* 'again, also'; Greenlandic Inuit *+(m)mi* 'and then'. Proto-Aleut **ma-* 'also, too' (Eastern Aleut also 'finally': cf. Atkan *maaya-* 'finally'). Cf. Fortescue—Jacobson—Kaplan 1994:412.

   Note also the Proto-Eskimo locative singular ending **-mi* (cf. Greenberg 2000:143; Fortescue—Jacobson—Kaplan 1994:442). Fortescue—Jacobson—Kaplan (1994:446, note 10) point out that this ending is also found in Aleut (cf. *qila-m* 'in the morning').

G. Etruscan: In Etruscan, we find the enclitic copula *-m* (*-um* after a consonant) 'and', which may also be compared (cf. Bonfante—Bonfante 2002:104). Perhaps the preposition *pi* (also *pen*, *pul*, *epl*) 'at, in, through' belongs here as well (if from **bi*).

Sumerian: In Sumerian, there is a conjunctive prefix *-m-* and a third person singular comitative prefix inanimate *-m-da-*. The *-da-* in *-m-da-* is the standard Sumerian comitative element. The *-m-* may be related to the forms we have been discussing here. Note also the locative-terminative prefixes *ba-*, *bi-* (on which, cf. Thomsen 1987:176—185).

16.33. Directive(-locative) **-ri* (Greenberg: §29. Locative RU)

The exact meaning of this formant is difficult to determine, though something like 'direction to or towards; motion to or towards' (as in Mongolian) is probably not too far off. In the Eurasiatic languages (including Etruscan), its primary function appears to have been to form adverbs from pronominal stems.

A. Afrasian: Note the Egyptian preposition *r* (originally *ỉr*) ‘to; at; concerning; more than; from’. It could also be used as a conjunction meaning ‘so that, until, according as’. According to Gardiner (1957:125), the original meaning appears to have been ‘to, towards’.
B. Indo-European: In Indo-European, there is a suffix **-r* that is added to pronominal stems to form adverbs; examples include: Proto-Indo-European **$k^{wh}\check{e}$-r*, **$k^{wh}\check{o}$-r* ‘when?, where?’ (cf. Sanskrit *kár-hi* ‘when?’; Latin *cūr* [< Old Latin *quōr*] ‘why?’; Gothic *hvar* ‘where?’; Old Icelandic *hvar* ‘where?’; Old English *hwǣr* ‘where?’; Lithuanian *kuř* ‘where?’); Proto-Indo-European **$t^h\check{e}$-r*, **$t^h\check{o}$-r* ‘there’ (cf. Sanskrit *tár-hi* ‘there’; Gothic *þar* ‘there’; Old English *þāra*, *þǣr* ‘there’; Old High German *thar* ‘then, there’), etc. (cf. Brugmann 1904:456, §583; Burrow 1973:281; Krause 1968:206, §195; Beekes 1995:220).
C. Uralic: Greenberg (2000:148) cites Zyrian / Komi *kor* ‘when?’, apparently constructed in the same way as the Indo-European forms cited above. Greenberg (2000:148) also suggests that the Hungarian sublative ending *-ra* ~ *-re* may belong here (cf. Collinder 1957:377). Perhaps also Proto-Yukaghir applicative affix **-ri:* (> Northern / Tundra *-ri:-*) (cf. Nikolaeva 2006:83).
D. Altaic: In Mongolian, there is a rare case suffix **-ru* with the meaning ‘direction to or towards; motion to or towards’ (cf. Poppe 1955:205). It is only found in Mongolian (in a few adverbs), Ordos, Khalkha, and Buriat (cf. Written Mongolian adverbs *inaru* ‘this side, prior to’, *činaru* ‘that direction, after’; Ordos *otoərū* ‘in the direction of the Otog banner’; Khalkha *moddɒrū* ‘towards the woods’; Buriat *uharū* ‘towards the water’, *morilū* ‘towards the horse’). In Tungus, there is a suffix *-r(i)* that is added to pronominal stems to form adverbs; examples include: Lamut / Even *ər* ‘there, the one there’, *tar* ‘yonder, the one yonder’; Manchu *e-de-ri* ‘this time, this way, by here’, *te-de-ri* ‘from there, by there, from that’ (cf. Greenberg 2000:148—149). Turkic also has a suffix *-r(V)*. Its primary use appears to have been to form adverbs from pronominal stems (cf. Greenberg 2000:148). Starostin—Dybo—Mudrak (2003:221) reconstruct a Proto-Altaic directive suffix **-rV* on the basis of: Mongolian directive *-ru*; Old Turkic directive *-γa-ru*/*-ge-rü* (also **-ra*, **-rü*); Korean lative *-ro* (a merger of the comitative and directive cases).
E. Chukchi-Kamchatkan: Greenberg (2000:149) cites the following Chukchi examples in which a suffix *-ri* is used to form adverbs: *ənkə-ri* ‘thither’ (cf. *ənkə* ‘there, then’), *miŋkə-ri* ‘whither?’ (cf. *miŋkə* ‘where?’).
F. Gilyak / Nivkh: Greenberg (2000:149) notes that a suffix *-r* is used in the Amur dialect to form adverbs of place; he cites the following forms: *tu-r* ‘here’, *hu-r* ‘there’, *t^ha-r* ‘on water near the shore’, *k^he-r* ‘upstream’, *k^hi-r* ‘a higher place’. Cf. also Gruzdeva 1998:36.
G. Etruscan: An adverbial *r*-suffix is found in *θar* ‘there, thither’ (motion towards) (cf. Bonfante —Bonfante 2002:105 and 220).

Sumerian: In addition to the common form *-ni-*, Sumerian also has a locative prefix *-ri-* (cf. Thomsen 1987:234). This may be compared with the forms being discussed here. It is also interesting to note that Sumerian has a distant demonstrative stem *ri*

'that, yonder' (cf. Thomsen 1987:80—81), which may be in some way related to the forms under discussion here.

16.34. Locative *-*i* (Greenberg: §31. Locative I)

This formant may be a derivative of the proximate demonstrative stem *ʔ*i*- (~ *ʔ*e*-).

A. Afrasian: Ehret (1980:51) reconstructs the Proto-Southern Cushitic locational suffix *-*i* (*-*ʔi*) in: Burunge *tiʔi* 'here', *taʔi* 'there'; Ma'a *twaʔi* 'there', *ilaʔi* 'this direction', *iʔi* 'here', *araʔi* 'there referred to'.
B. Indo-European: The most common locative singular case marker in Proto-Indo-European was *-*i*: Sanskrit *pitári* (*pitar*- 'father'), *ukṣáṇi* (*ukṣan*- 'ox'), *udáni* (*udan*- 'water'), *padí* (*pad*- 'foot'), *mūrdháni* (*mūrdhan*- 'head'); Greek πατέρι (πατερ- 'father'); Hittite *pa-ar-ni* 'at home' (nom. sg. *pí-ir*, gen. sg. *pár-na-aš*) (cf. Beekes 1995:173; Brugmann 1904:384—386; Gamkrelidze—Ivanov 1995.I:247—250; Meillet 1964:295; Szemerényi 1996:160; Burrow 1973:234; Sihler 1995:253; Lehmann 1993:145; Fortson 2010:116, §6.11), though the bare stem could be used instead. *-*i* is also found in adverbs (cf. Greenberg 2000:153): cf. Greek ἐκεῖ 'there, in that place'.
C. Eskimo: The Proto-Eskimo deictic *-*i* used with demonstratives (cf. Fortescue—Jacobson—Kaplan 1994:399) most likely belongs here. Greenberg (2000:153—154) discusses other evidence in Eskimo for an original locative *-*i*.
D. Etruscan: In Etruscan, the locative ending is -*θi*. I regard this as a hyper-characterized form in which the locative ending -*i* has been added to a locative -*θ* (< the comitative-locative ending *-*da* [there is no voicing contrast in stops in Etruscan] or < the oblique marker *-t^h).

Sumerian: In Sumerian, there is a locative-terminative postposition -*e*, which is only used with inanimate beings. The locative-terminative is used to indicate the direction 'near to' or 'near by'. As an adverb, *e* simply means 'here'. I suspect that this may be related in some way to the locative -*i* under discussion here.

16.35. Comitative-locative particle **da* (Illič-Svityč 1971—1984.I:212—214, no. 59, **da* locative particle; Dolgopolsky 2008, no. 508, **d[E]H$_1$a* 'with, together with' and no. 579, **d[oy]a* [> **da*] 'place'; Hegedűs 1997:108—112; Nafiqoff 2003:41—42 **daHʌ* and 101; Greenberg: §32. Locative TA)

A comitative-locative particle **da* (~ **də*) with the basic meaning 'along with, together with, in addition to; in, at', shows up all over Nostratic (cf. Bomhard—Kerns 1994:275—276, no. 89). I would equate the forms Greenberg lists with the widespread Proto-Nostratic comitative-locative element **da* (~ **də*) discussed there and would, therefore, derive them from Proto-Eurasiatic **da* instead of *TA*. Thus, I

suggest that it would have been better to have written "§32. Locative DH." This is a case where material from the non-Eurasiatic Nostratic languages can help explain developments in Eurasiatic. Greenberg sometimes confuses the Altaic reflexes of this particle with those of oblique *-*tʰa* (see below), as does (to a lesser extent) Sinor (1988:716—718), which is understandable given the phonology involved and the overlapping semantics between the two forms.

A. Afrasian: Diakonoff (1988:61) reconstructs a Proto-Afrasian *-*dV*, *-*Vd* comitative-dative case on the basis of evidence from Cushitic (Agaw) and Berber-Libyan. A comitative-locative particle **da*/**də* is widespread in Chadic: cf. Hausa *dà* 'with; and; by, by means of; regarding, with respect to, in relation to; at, in, during; than'; Kulere *tu*; Bade *də*; Tera *ndə*; Gidar *di*; Mokulu *ti*; Kanakuru *də* < Proto-Chadic **də* 'with, and'. Cushitic: Burji locative suffix *-ddi* (< *-*n-di* [cf. Hudson 2007:540]); Bilin comitative case *-di*.
B. Elamo-Dravidian: The locative element **da*/**də* may also be found in the Proto-Dravidian sociative (comitative) ending *-*ŏ̄ṭu* (cf. Krishnamurti 2003: 237). Particularly noteworthy are the Tuḷu locative endings *-*ḍu* ~ *ṭu*, *-*ḍi* ~ *ṭi*, which may, perhaps, be compared with the Tamil locative postposition *-*iṭai* (Proto-Dravidian medial *-*ṭ-* < Proto-Nostratic *-*d-*). Possibly also Royal Achaemenid Elamite, Neo-Elamite *da* (also *-da* in *-be-da*, *e-da*, *ku-da*, etc.) 'also, too, as well, likewise; so, therefore, consequently, hence, accordingly; thereby, thereupon' (cf. Paper 1955:107 *ku-ud-da* 'and'). Note also: Middle Elamite, Neo-Elamite *tak* 'also' (< *da-* 'also' + *a-ak* 'and').
C. Kartvelian: This particle appears in Kartvelian as a conjunction: Proto-Kartvelian **da* 'and' > Georgian *da* 'and'; Mingrelian *do* 'and'; Zan *do* 'and' (cf. Fähnrich—Sardshweladse 1995:97—98; Fähnrich 2007:120—121; Klimov 1964:68—69 and 1998:35—36). It is also probably found in the Proto-Kartvelian adverbial case ending *-*ad*/*-*d* > Old Georgian *-ad*/*d* (in Modern Georgian, the ending is *-ad[a]*); Mingrelian *-o*/*-t*/*-ot*; Laz *-o*/*-t*; Svan *-ad*/*-d* (cf. Klimov 1964:43 and 1998:1; Fähnrich—Sardshweladse 1995:31; Fähnrich 1994:240, 254, and 2007:32—33).
D. Indo-European: Greenberg (2000:155) compares the Indo-European suffix *-*dʰe* found in adverbs of place with the forms under discussion here. *-*dʰe* is preserved in the daughter languages in the suffixed particle appearing, for example, in Sanskrit as *-ha* and *-dhi*: *sa-há* 'with' (Vedic *sa-dha*), *i-há* 'here' (Prakrit *i-dha*), *kú-ha* 'where?', *á-dhi* 'above, over, from, in'; in Avestan in *iδa* 'here', *kudā* 'where?'; and in Greek in the locative particle -θι in, for example, οἴκο-θι 'at home', πό-θι 'where?'. Cf. Burrow 1973:281; Beekes 1995:220; Brugmann 1904:454—455 *-*dhe* and *-*dhi*; Fortson 2004:107 and 2010:119.
E. Altaic: Particularly interesting is Altaic, where this particle functions as a (dative-)locative suffix on the one hand, *-*da*, and as an independent particle on the other, **da* 'together with, and, also': Common Mongolian dative-locative suffix *-*da* > Mongolian *-da*; Dagur *-da*; Khalkha *-dɒ*; Buriat *-da*; Kalmyk *-dɒ* (cf. Poppe 1955:195—199). In Manchu, the dative-locative particle is *-de*. In Turkic, it also appears as a locative(-ablative) suffix:

Common Turkic *-*da*/*-*dä* (cf. Menges 1968b:110) (Róna-Tas 1998:73 reconstructs *-*dA*). Starostin—Dybo—Mudrak (2003:221) reconstruct a Proto-Altaic dative/locative suffix **du*/**da* on the basis of: Proto-Tungus dative **du*, locative *-*dā*-; Old Japanese attributive/locative *-tu* (although this suffix can also be compared with Mongolian adjectival *-tu*); Mongolian dative/locative *-da*/*-du-r*, attributive *-du*; Old Turkic locative/ablative *-ta*/*-da*/*-te*/*-de*.

F. Chukchi-Kamchatkan: Note the Proto-Chukchi-Kamchatkan instrumental case marker *-*tæ* and the suffix *-*tæ* in the comitative 1 case marker **kæ*- -*tæ* 'together with' (both class 1). Cf. Fortescue 2005:426. Perhaps also Proto-Chukotian **to* 'and' > Koryak *to* 'and'; Alyutor *tu* (Palana *to*) 'and'. Cf. Fortescue 2005:288.

G. Etruscan: As noted above, in Etruscan, the locative ending is *-θi*. I regard this as a hypercharacterized form in which the locative ending *-i* has been added to a locative ending *-θ* (< the comitative-locative ending *-*da* [there is no voicing contrast in stops in Etruscan] or < the oblique marker *-*t*^{h}). The Etruscan form is particularly reminiscent of the Greek locative particle -θι (< Proto-Indo-European *-*d*^{h}*i*).

Sumerian: Sumerian comitative element *da* (also *-dè*). As noted by Thomsen (1987:99): "The basic meaning of the comitative is 'with', 'together with', expressing accompaniment as well as mutual action."

16.36. Oblique *-*t*^{h}*a* (Greenberg: §33. Ablative TA)

This formant served as the basis for a number of oblique cases in the various Nostratic daughter languages. Only Dravidian retains it as a general oblique marker.

A. Afrasian: Ongota has the locative suffix *-tu*/*-to* (cf. Fleming 2002b:40).

B. Elamo-Dravidian: McAlpin (1981:110—112, §522.4) reconstructs a Proto-Elamo-Dravidian oblique/locative ending *-*tə*. McAlpin notes that this form is confused with the appelative and derivational ending *-*tə* in Elamite, though it may be found in the locative-genitive particle *-da* (*-te*) (cf. Khačikjan 1998:53). In my opinion, we are dealing here with what were originally two separate particles, the first of which, *-da*, probably belongs with the comitative-locative particle **da* discussed above, the second of which, *-te*, belongs here. The two have become confused in Elamite. In Dravidian, the *-*tə* reconstructed by McAlpin developed into the oblique augment *-*tt*-: Old Tamil *mara-tt-* in (loc. sg.) *mara-tt-il* 'in a tree', (dat. sg.) *mara-ttu-kku* 'to a tree'; Malayalam (gen. sg.) *mara-tt-in* 'of a tree'; Iruḷa (acc. sg.) *mara-tt-e* 'tree'; Kannaḍa (instr.-abl.) *mara-d-inda* 'by the tree'; Pengo *mar* 'tree': (acc. sg.) *ma(r)-t-iŋ*, (loc. sg.) *ma(r)-t-o*, (gen. sg.) *ma(r)-t-i*, (instr.-loc.) *mar-(t)-aŋ*; Parji *mer* 'tree': (gen. sg.) *mer-t-o*, (loc. sg.) *mer-t-i*; etc. (cf. Krishnamurti 2003:218—221).

C. Kartvelian: Worth noting is the Proto-Kartvelian instrumental suffix *-*it* (cf. Georgian *-it*/*-jt*/*-t*, Mingrelian *-(i)t*/*-t*, Laz *-t*), which may ultimately come from

the same formant under discussion here. Cf. Fähnrich 1994:240 and 2007:213; Fähnrich—Sardshweladse 1995:177—178.

D. Indo-European: Greenberg (2000:157—158) tries to compare the Proto-Indo-European thematic ablative singular case ending *-*ēd*/*-*ōd* (cf. Brugmann 1904:282—283; Buck 1933:176, 181, 196, and 199; Szemerényi 1996:160) (cf. Sanskrit -*āt* [-*ād*]; Oscan -*ud*, -úd; Old Latin -*ē/ōd*; etc.) with the forms under consideration here. However, this ending is best seen as a particle that has been incorporated into the thematic declenstion instead (cf. Lundquist—Yates 2018: 2087), *-*ō/ē-t*^{h}- < *-*o/e-*+H_1*(e)t*^{h}-. On the other hand, the archaic ablative singular case ending in *-*t*^{h}*os* (cf. Sihler 1995:246—247) probably belongs here (cf. Sanskrit -*tas*; Latin -*tus*; Greek -τος). According to Sturtevant (1951.I:88, §134), the Hittite ablative singular ending -*az* represents "the zero grade of the adverbial suffix -*tos*".

E. Uralic-Yukaghir: Collinder (1960:287—288) posits a Proto-Uralic separative suffix *-*ta* ~ *-*tä*, but later (1960:291), he refers to this case as "partitive". Finally, he (1960:296—297) notes that there was probably a locative case in *-*tta* ~ *-*ttä* in Proto-Finno-Ugrian. Abondolo (1998a:18) reconstructs a Proto-Uralic separative *-*tA* ~ *-*tI*. According to Marcantonio (2002:285), two separate case suffixes are to be reconstructed for Proto-Uralic: (a) locative *-*t* and (b) ablative *-*t(V)*. She notes: "The ending -*t(V)* is fully functional as a Locative in Vogul (but not in Ostyak); it is present in Hungarian and Samoyed Yurak in fossilised forms. The ending -*t(V)* is also present in Balto-Finnic, Permian, Samoyed, Lapp. In Finnish, it has the function of Partitive." Further: "The Ablative -*t(V)* is absent in Ob-Ugric languages. In Hungarian, in addition to -*t*, there is an Ablative -*l*, which is also used to form complex endings, such as -*tV-l* (see Table 8.5). This morpheme is found also in Vogul, where it is used to express Instrumental/Comitative functions. In its Ablative function it co-occurs with the Vogul Dative/Lative *-*nV* …, to form the complex ending -*nV-l*." The following forms are found in the Uralic daughter languages (these are taken from Collinder 1960:287—288 and 1965:124): Finnish -*ta* ~ -*tä* after monosyllabics and sometimes after trisyllabics (but -*a* ~ -*ä* after disyllabics that are not the result of contraction); Veps -*d*; Lapp / Saami -*htě* (or -*tě*) after monosyllabic stems ending in a vowel, otherwise -*t*; Mordvin -*do* ~ -*de* (but -*to* ~ -*te* after a voiceless consonant); Cheremis / Mari -*c*, -*ć*. Proto-Yukaghir ablative affix *-*t* (> Northern / Tundra -*t*) (cf. Nikolaeva 2006:83).

F. Altaic: According to Greenberg (2003:150), "[i]n Altaic, the ablative-instrumental *t* is found only in Yakut, the non-Chuvash Turkic language that is genetically the most remote. Here we find an instrumental -*tɨ* ~ -*ti* and an indefinite accusative -*ta*". Stachowski—Menz (1998:421) list Yakut (a) partitive -*TA*, which they derive from an old locative suffix, and (b) ablative -*(t)tAn*: (a) partitive: *eyete* (*eye* 'peace'), *uotta* (*uot* 'fire'), *oχto* (*oχ* 'arrow'); (b) ablative: *eyetten*, *uottan*, *oχton*. Menges (1968b:110) mentions the existence in Turkic of an old locative in -*t*, which survives only in petrified forms. Finally, Greenberg (2003:150) notes that "[i]n Northern and Southern Tungus (but not in Manchu), there is an instrumental -*ti*". Sinor (1988:716—718)

provides an excellent overview of the reflexes of *-t*, *-tä* in the Uralic and Altaic languages and the interrelationship between the various forms.

Sumerian: As noted by Thomsen (1987:88 and 103—108), the Sumerian ablative-instrumental case ending is (inanimate) *-ta*, (prefix chain) *-ta-*. Likewise, Hayes (1997a:16): ablative-instrumental *-ta* (/*-t*/ after vowels) 'from, by'.

16.37. Possessive **-lV* (Greenberg: §40. Possessive L)

A. Afrasian: (?) Coptic *la-* [ⲗⲁ-] plus noun, forming adjectives, 'possessing, endowed with'. Cf. Vycichl 1983:93 (probably not derived from Egyptian *n*, *ny* 'belonging to'); Černý 1976:69.
B. Kartvelian: In Georgian, there is a suffix *-el-* which is used to form adjectives of nationality designating human beings; examples include: *kartveli* and *kartuli* 'Georgian', *megreli* and *megruli* 'Mingrelian', *ingliseli* 'English', *čineli* 'Chinese', etc. This same suffix is used to derive adjectives designating human beings from common nouns: cf. *kalakeli* 'citizen, city-person' (< *kalaki* 'city'), *sopleli* 'peasant, country-person' (< *sopeli* 'village'), etc. The fundamental meaning of the Proto-Kartvelian **-el-* suffix appears to have been 'pertaining to' or 'belonging to'. Cf. Hewitt 1995:108; Vogt 1971:231—232; Fähnrich—Sardshweladse 1995:121—122; Fähnrich 2007:147; Klimov 1998:46.
C. Indo-European: In Hittite, one of the primary functions of the suffix *-li-* is to form adjectives indicating nationality (cf. Kronasser 1966:211—214); examples include: *Ḫurrili-* 'Hurrian', *Ḫattili-* 'Hattic', *Palaumnili-* 'Palaic', *Luwili-* 'Luwian', *Nāšili-* and *Nešumnili-* 'Hittite (?)', etc. Lydian also has a possessive suffix *-li*, which has the underlying meaning 'pertaining to' or 'belonging to' (cf. Gusmani 1964:36—37; Greenberg 2000:174), as in (nom. c.) *manelis* 'pertaining to Maneś' from the noun (nom.) *Maneś*. The ending *-ili-* is also used to derive adjectives from adverbs in Hittite (cf. Luraghi 1997:20).
D. Yukaghir: Proto-Yukaghir possessive affix **-l'ə* (cf. Nikolaeva 2006:81).
E. Altaic: According to Greenberg (2000:173), "[i]n Turkic there is a common suffix *-li* that derives adjectives or nouns from nouns, with the resulting meaning 'possessing the thing or quality expressed by the noun'." Greenberg cites the following examples from Turkish: *ev* 'house', *ev-li* 'possessing a house'; *el* 'hand', *el-li* 'having a hand or handle'; *yaz-ı* 'writing', *yaz-ı-lı* 'written, inscribed, registered' (*yaz-* 'to write'). Greenberg (2000:173) further notes: "In Old Turkish there is also a suffix *-lä* with essentially the same meaning, e.g. *körk-lä* 'beautiful,' *körk-* 'form' (Gabain 1950:65). Chuvash has a similar adjectival suffix *-lă*, e.g. *čap-lă* 'famous,' *čap-* 'fame' (Krueger 1961: 130—31)."
F. Etruscan: In Etruscan, personal names often have a genitive ending *-al*: cf. *aule velimna larθal clan* (= *aule velimna larθalisa*) 'Aulus Velimna, son of Larth' (*larθalisa* is a patronymic form in which the ending *-isa* replaces *clan*) (cf. Bonfante—Bonfante 2002:87—88). The general scheme was as follows:

Nominative	Genitive	Patronymic
larθ	*larθal*	*larθalisa*
arnθ	*arnθal*	*arnθalisa*
laris	*larisal*	*larisalisa*

We can venture a guess that the original meaning of *-al* was 'belonging to', so that *larθal* would have originally meant 'belonging to Larth'. The patronymic can be seen as a hypercharacterized form in which the genitive ending *-isa* was added to the ending *-al*. The ending *-la* could be added again to the patronymic to indicate the grandfather: cf. *larθalisla* in the phrase *arnθ velimna aules clan larθalisla*, where Larth is the father of Aule and, therefore, the grandfather of Arnth. Interestingly, in this example, *aules* contains the genitive ending *-s*. Thus, we can render this loosely as 'Arnth Velimna, son of Aule, belonging to Larth', that is, 'Arnth Velimna, son of Aule, whose father was Larth'.

IV. DERIVATIONAL SUFFIXES

In the following sections, the cover term "nominalizer" is used for any suffix that is used to create nouns and adjectives (in the daughter languages — adjectives did not exist as a separate grammatical category in Proto-Nostratic), whether from verbs or nouns. Some of these forms are also listed under non-finite verb forms.

16.38. Nominalizer **-r-* (Greenberg: §13. Substantivizer RE; see also Bomhard—Kerns 1994:169; Dolgopolsky 2008, no. 1953, **rV* [< **ʔV[r]V* ?] theme-focalizing [topicalizing] particle)

A. Afrasian: Ehret (1995:18) reconstructs two separate nominal **r* suffixes for Proto-Afrasian: (a) **r* instrument and complement deverbative suffix and (b) **r* adjective suffix. Ehret notes that the latter suffix is used to form modifiers, usually from verbs. These may belong with the forms under discussion here. Ehret (1980:57—58) lists a large number of Southern Cushitic noun and adjective suffixes in **-Vr-*: (a) noun suffixes: Proto-Southern Cushitic **-ara* (masculine) > Iraqw; Burunge *-ara*, K'wadza *-ala*, Asa *-ara*, Ma'a *-ara*, Dahalo *-ara*; Proto-Southern Cushitic **-are* > K'wadza *-ale*, Ma'a *-are*, Dahalo *-are*; Proto-Southern Cushitic **-aro* > Iraqw *-aro*, K'wadza *-alo*, Asa *-ar-* in complex *-arok*, Ma'a *-alo*, Dahalo *-aro*; Proto-Southern Cushitic **-aru* > Burunge *-aru*, Dahalo *-aru*; Proto-Southern Cushitic **-era* > Burunge *-era*, K'wadza *-ela*, Asa *-era*, Ma'a *-era*; Proto-Southern Cushitic **-ere* > Ma'a *-ere*, Dahalo *-ere*; Proto-Southern Cushitic **-ero*, **-eru* > Burunge *-eru* (verbal-noun suffix), K'wadza *-el-* in complex *-eluko*, Ma'a *-(e)ru*, Dahalo *-eero*; Proto-Southern Cushitic **-eri* (feminine) > Burunge *-eri* (noun and adjective suffix), Alagwa *-eri*, Ma'a *-eri*, Dahalo *-eeri*; Proto-Southern Cushitic **-iiri* > Alagwa *-iri*, K'wadza *-il-* in complexes *-ilika*, *-ilita*, Ma'a *-iri*, Dahalo *-iiri*; Proto-

Southern Cushitic *-*ore* > Ma'a -*ore*, Dahalo -*oore* (also -*ora*); Proto-Southern Cushitic *-*ori* > Iraqw -*ori*, Ma'a -*ori*, Dahalo -*ori*; Proto-Southern Cushitic *-*oro* > Iraqw, Burunge -*oro* (no longer productive), K'wadza -*ol-* in complex -*oluko*, Ma'a -*olo* (no longer productive), Dahalo -*ooro*; Proto-Southern Cushitic *-*ura* > Iraqw, Alagwa -*uru*, K'wadza -*ul-* in complex -*uluko*, -*ulungayo* (cf. also -*ule*), Ma'a -*ure*, -*ura*, Dahalo -*ura*; (b) adjective suffixes: Proto-Southern Cushitic *-*ari* > Iraqw, Alagwa -*ar*, Burunge -*ari*, K'wadza -*al(i)-*, Asa -*ara*, Ma'a -*ari*, Dahalo -*are*, -*aare*; Proto-Southern Cushitic *-*iru* > Alagwa -*iru* (noun suffix), Iraqw -*ir*, Burunge -*iru* (noun suffix), Asa -*ir-* noun suffix in complex -*iruk*, Ma'a -*(V)ru*. In his analysis of third consonants in Semitic roots, Ehret (1989:128—131) identifies three uses of *r: (a) *r diffusive (as in Arabic *ʔafr* 'to attack, to drive away', *sabr* 'to probe or clean a wound', *namr* 'to ascend, to mount', etc.), (b) *r noun suffix (as in Arabic *faǧr* 'split, opening, hole', *bahr* 'abuse', *kasr* 'breach, fracture', *maǧr* 'thirst', etc.), and (c) *r modifier suffix (as in Arabic *baṯr* 'much', *baṯīr* 'much, many', *ḳaṣr* 'shortness', etc.).

B. Elamite: Note the animate ending -*r* found in the Elamite third singular anaphoric (animate sg.) *i-r* 'this one here', (neuter) *i-n* 'this' (cf. Grillot-Susini 1987:17). This may belong here. Also note the derivational suffix -*r(a)* used to form personal nouns indicating a member of a group (cf. Khačikjan 1998:12): cf. *liba-r* 'servant', *peti-r* 'enemy', *hinduya-ra* 'Indian' (< *Hinduš* 'India'), *kurtaš-ra* 'worker' (*kurtaš* is a loan from Old Persian).

C. Indo-European: The origin of the heteroclitic declension in Indo-European has long defied explanation. In the heteroclitic stems, the nominative-accusative is characterized by -*r*, while the oblique cases are characterized by -*n*. A good example here is Sanskrit (nom. sg.) *ásṛk* 'blood' versus (gen. sg.) *asnás* (an additional suffix has been added to the nominative singular), which has an exact parallel in Hittite (nom-acc. sg.) *e-eš-ḫar* 'blood' versus (gen. sg.) *e-eš-ḫa-na-aš*, *e-eš-na-aš*) (cf. Tocharian A *ysār* 'blood', Greek ἔαρ 'blood', Latin *assir* 'blood'). This is an archaic type of neuter noun, which is abundantly represented in Hittite, but which is tending towards obsolescence in the older non-Anatolian daughter languages (cf. Burrow 1973:127). In looking at the other Nostratic daughter languages, we find an exact match for this patterning in Altaic. The Common Mongolian nominative singular of the demonstrative stem *te- has an extended form *te-r-e, while the oblique cases are built upon *te-n (also *te-gün) (cf. Poppe 1955:225—228). At long last, the origin of the heteroclitic stems in Indo-European is clear: the nominative singular was created by adding the nominalizing particle *-*ri*/*-*re*, while the oblique cases were built upon the Common Nostratic oblique marker *-*n* (see above for details). A trace of this element as a separate particle may survive in the Cuneiform Luwian enclitic particle -*r* (on which, cf. Melchert 1993b:182 and Laroche 1959:83).

The suffix *-*ro*- was also used to create verbal adjectives in Indo-European (cf. Brugmann 1904:329, §404; Burrow 1973:147—148; Sihler 1995:628; Lindsay 1894:328—331; Palmer 1980:258): cf. Sanskrit *rud-rá-ḥ*

'gleaming', *nam-rá-ḥ* 'bowing', *ug-rá-ḥ* 'powerful', *chid-rá-ḥ* 'torn apart', *a-vadh-rá-ḥ* 'not hurting', *vak-rá-ḥ* 'cooked'; Greek πικ-ρό-ς 'sharp', λυγ-ρό-ς 'hurtful', νεκ-ρό-ς 'dead', λεπ-ρό-ς 'scabby'; Latin *cā-ru-s* 'dear', *gnā-ru-s* 'knowing'. It was also used to create concrete nouns (Burrow 1973:148 considers these forms to be mainly substantivized adjectives): cf. Latin *ager* (*-er* < **-ros*) 'field'; Sanskrit *áj-ra-ḥ* 'plain, flatland'; Greek ἀγ-ρό-ς 'field'; Gothic *akrs* 'field'; Old English *æcer* '(cultivated) field'; Dutch *akker* 'field'.

D. Altaic: The main evidence Greenberg (2000:101) cites for reconstructing a Eurasiatic nominalizing morpheme **-ri* ~ **-re* comes from Altaic. Specifically, it is found in Mongolian and Tungus: (a) Mongolian: Mongolian *te-re* 'this' (pl. *te-de*); Dagur *tẹ-rẹ* 'this'; Ordos *te-re* 'this'; Khalkha *te-rə* 'this'; Buriat *tẹ-rẹ* 'this'; Kalmyk *te-r* 'this'; (b) Tungus: Manchu *e-re* 'this', *te-re* 'that'; Solon *ẹ-ri* 'this', *ta-ri* 'that'. As noted above, the stem of the oblique cases in the Mongolian languages is **te-n* (also **te-gün*).

16.39. Nominalizer **-m-* (Greenberg: §39. Nominalizer M; Bomhard—Kerns 1994:169; Illič-Svityč 1971—1984.II:45—48, no. 284, **mA* formant with nominal function in relative constructions; Dolgopolsky 2008, no. 1352, **mA* marker of nominalized syntactic constructions, nominalizer that formed analytic equivalents of nomina actionis, nomina agentis, and other derived nouns)

A. Afrasian: Ehret (1995:17) reconstructs two suffixes for Proto-Afrasian: (a) **-m* attributive noun suffix and (b) **-m* adjective-forming suffix. He notes that "[t]he C_3 position and is well attested also for Egyptian, Cushitic, Chadic, and Omotic". Ehret claims that "[t]he **mV-* instrument-agent prefix of Semitic, Egyptian, and Chadic is argued below (this chapter) to have an origin quite distinct from that of this suffixed **m* deverbative". In his groundbreaking work on the origin of third consonants in Semitic roots, Ehret (1989:163—164) lists a large number of triliteral roots in Arabic in which *m* in C_3 position can be derived from just such a deverbative noun-forming suffix: cf. *šağam* 'ruin, perdition, death' (cf. *šağğa* 'to break, to split, to cleave, to fracture, to bash in'), *ḳaḍam* 'sword' (cf. *ḳaḍḍa* 'to pierce, to perforate, to bore; to break into pieces, to crush, to bray, to bruise, to pulverize [something]; to tear down, to demolish [a wall]; to pull out, to tear out [a peg or stake]'), *lifām* 'cloth covering the mouth and the nose' (cf. *laffa* 'to wrap up, to roll up, to fold up; to wind, to coil, to spool, to reel; to twist, to wrap, to fold; to envelop, to cover, to swathe, to swaddle'), etc. According to Moscati (1964:82—83, §12.22), the suffix *-m* is infrequent in Semitic and occurs mainly in Arabic adjectives: cf. *fuṣḥum* 'wide', *šadḳam* 'wide-mouthed'. Moscati also cites several examples with suffix *-m* from other Semitic languages: cf. Hebrew *śāφām* 'moustache'; Geez / Ethiopic *ḳastam* 'bow'. Similar formations occur in Cushitic: cf. Galla / Oromo *liil-am-a* 'thread' (< 'something whirled'; cf. *liil-* 'to whirl'); Sidamo *naadamme* 'pride' (*naad-* 'to praise', *naad-am-* 'to be

proud'), *ilama* 'generation' (*il-* 'to give birth, to beget', *il-ama* 'relative'), *baddimma* 'baldness' (*badd-* 'to be or become bald'); Kambata (adj.) *kotima* 'small, little' (*kot-is-* 'to decrease'), *abba(a)sima* 'straw broom' (*abba(a)s-* 'to sweep'); Hadiyya *liit-imma* 'mill' (*liit-* 'to grind'), *t'aban-s-imma* 'a slap' (*t'aban-s-* 'to slap'), *baddimma* 'fear' (*badd-* 'to be afraid', *badd-is-* 'to frighten'); Gedeo / Darasa *sood-umma* 'dawn' (*sood-* 'to dawn'); Burji *layimi*, *layma* 'bamboo' (*lay-* 'to sprout'), *k'alamo* 'generation' (*k'al-* 'to give birth', *k'ala* 'baby, child, young of animals', *k'al(a)-go-* 'to be pregnant'). Ehret (1980:51—53) lists a great variety of Southern Cushitic nominal suffixes in **-Vm-*: (a) noun singular suffixes: Proto-Southern Cushitic **-ama* > Iraqw, Burunge, Alagwa *-ama*, K'wadza *-am-* in complex *-amato*; *-ama*, Asa *-ama-* in complex *-amaok*, Ma'a *-(a)me*, Dahalo *-ama*; Proto-Southern Cushitic **-ame* (feminine ?) > Iraqw, Burunge, Alagwa *-ame*, Ma'a *-(a)me*, Dahalo *-ame*; Proto-Southern Cushitic **-amo* (masculine) > Iraqw, Alagwa *-amo*, K'wadza *-amo*, Dahalo *-amo*; Proto-Southern Cushitic **-amu* (masculine) > Iraqw, Burunge, Alagwa *-amu*, K'wadza *-amu*, Ma'a *-amu*; Proto-Southern Cushitic **-em-* > Iraqw, Burunge *-emo* (also Iraqw *-ema*), Alagwa *-ema*, *-emu*, K'wadza *-eme*, *-emo*, Dahalo *-emi*; Proto-Southern Cushitic **-ima* > Iraqw, Alagwa *-ima*, Asa *-ima*, Ma'a *-ime*, *-ima*, Dahalo *-ima*; Proto-Southern Cushitic **-imi* > Iraqw *-imi*, Ma'a *-imi*; Proto-Southern Cushitic **-imo*, **-imu* (masculine) > Burunge, Alagwa *-imo*, K'wadza, Asa *-imo*, K'wadza *-im-* in complex *-imuko*, Ma'a *-(i)mo*, Dahalo *-iimu*; Proto-Southern Cushitic **-om-* > Asa *-omo*, Burunge *-om-* in complex *-omiya*, Dahalo *-ome*, *-oome*, *-oma*; Proto-Southern Cushitic **-umo* > Ma'a *-umo*, Iraqw, Alagwa *-umo*, Dahalo *-ume*, *-uume*, *-uma*; Proto-Southern Cushitic **-umu* (masculine ?) > K'wadza *-umu*, *-um-* in complex *-umuko*, Asa *-um-* in complex *-umuk*, Dahalo *-umu*; (b) noun plural suffix: Proto-Southern Cushitic **-ema* > Iraqw *-emi*, Iraqw, Burunge *-ema* (also Iraqw, Burunge *-emo*), Dahalo *-VVma* (also *-VVme*, *-eemu*), Asa *-ema* (also *-imo*).

Ehret (1995:52) also discusses the **mV-* instrument-agent prefix and notes that it is an innovation in Semitic, Egyptian, and Chadic and should not be reconstructed for the Afrasian parent language. The prefixes *ma-*/*mi-*/*mu-* are common nominalizers in Semitic and have a wide range of meanings (cf. Moscati 1964:80—81, §12.26; Lipiński 1997:216—219).

B. Elamo-Dravidian: McAlpin (1981:107, §511) reconstructs a Proto-Elamo-Dravidian **-maḭ* (> Proto-Elamite **-may* [> *-me*], Proto-Dravidian **-may*), which "is used to derive abstract nouns from other nouns and occasionally from verbs". For Elamite *-me*, note (cf. Khačikjan 1998:12): *tuppi-me* 'text' (< *tuppi* 'tablet'), *titki-me* 'lie' (< *tit-* 'to lie), *liba-me* 'service' (cf. *liba-r* 'servant'), *takki-me* 'life', *sit-me* 'destiny'. For Proto-Dravidian **-may*, the following examples may be cited (cf. Krishnamurti 2003:200, §5.8.2): Tamil *peru-mai* 'abundance' (*pēr*/*per-u* 'big'); Telugu *pēr-mi* 'greatness, superiority'; Kannaḍa *per-me* 'increase, greatness', *hem-me* 'pride, insolence'. Krishnamurti (2003:200) also reconstructs: (a) a Proto-Dravidian noun formative **-am*, added to an intransitive or transitive verb stem, plus (b) several compound

nominalizers built upon *-*am*: cf. (a) **cōṭ-am* 'boat' (< **cōṭ-* 'to run') > Tamil, Malayalam *ōṭ-am* 'boat'; Kannaḍa *ōḍ-a* 'boat' (also note: *sōl-am* 'defeat' [< *sōl-* 'to be defeated']); Tuḷu *ōḷ-a* 'boat'; Telugu *ōḍ-a* 'boat'; (b) *-am+t+am* → *-antam* in, for example, Tamil, Malayalam *opp-antam* 'agreement, contract', Telugu *opp-andamu* 'agreement, contract', Kannaḍa *opp-anda* 'agreement, contract', Tuḷu *opp-anda* 'agreement, contract, treaty' (< *oppu-* 'to agree'); also note Tamil *opp-am* 'comparison, resemblance' from the same verb. Cf. Burrow—Emeneau 1984:89, no. 924.

C. Kartvelian: In Georgian, an *m*-prefix is used in various prefix + suffix combinations (confixes) to form active participles; these include the following: *m-...-ar* (also *m-...-al*), *m-...-el*, *ma-...-el*, *me-...-ar*, *mo-... -ar* (also *mo-...-al*), *mo-...-e* (for a complete list of Old Georgian active participles formed with *m*-prefixes, cf. Fähnrich 1994:76—77; for Modern Georgian, cf. Fähnrich 1993:66—67 and Vogt 1971:249—250). Some examples are: m-*sm*-el-*i* 'drinker' (*v-svam* 'I drink'), me-*om*-ar-*i* 'warrior' (*v-om-ob* 'I wage war'), m-*c'er*-al-*i* 'author, writer' (*v-c'er* 'I write'), etc. Other *m*-prefix + suffix combinations figure in nominal derivation as well. This may be an example of where Georgian is using as a prefix what appears as a suffix elsewhere. This is not unusual. It seems that Kartvelian underwent several syntactic shifts in its prehistoric development (possibly SOV > SVO and then back to SOV, each change leaving a trace in the surface morphology of the daughter languages), no doubt due to prolonged contact with North Caucasian and (perhaps) one or more unknown other languages. Thus, I believe that these Georgian *m*-prefix + suffix forms are comparable to the forms under discussion here. Similar verbal substantives with *m(V)*-prefix are common in other Kartvelian languages: cf. Svan *me-sgwre* 'sitting; servant' (*li-sgwre* 'to sit'), *me-sed* 'one who remains' (*li-sed* 'to remain'), *me-γrāl* 'singer' (*li-γrāl* 'to sing'), etc.

D. Indo-European: *m*-suffixes play an important role in nominal derivation in Indo-European (cf. Burrow 1973:173—176; Brugmann 1904:346 and 347—348; Meillet 1964:265—266 and 274—275; Lindsay 1894:328; Palmer 1980: 252), and a great variety of suffixes exist: **-mo-*, **-mer-*, **-men-*, **-meno-*, **-ment^h-*, **-emo-*, **-t^{h}emo-*, etc. The suffix **-mo-* forms a large number of adjectives and nouns — a few examples include: Sanskrit *yug-má-ḥ* 'paired', *bhī-má-ḥ* 'fearful', *madhya-má-ḥ* 'being in the middle', *aj-má-ḥ* 'career, march', *ghar-má-ḥ* 'heat', *tig-má-ḥ* 'sharp'; Greek θερ-μό-ς 'hot', στιγ-μό-ς 'puncture' (cf. also στίγ-μα, στιγ-μή), ἀρ-μό-ς 'the fastenings (of a door)'; Latin *for-mu-s* 'hot'; etc.

E. Uralic: According to Collinder (1960:266—269 and 1965:111—112), the suffix **-ma* ~ **-mä* is used: (a) in Fennic, to denote a single instance of verb activity or the result of the action: cf. Finnish *jäämä* 'remainder, rest' (*jää-* 'to remain'), *luoma* 'creation, work' (*luo-* 'to create'), *repeämä* 'rent, tear, rupture, breach, cleft' (*repeä-* 'to rend, to tear [tr.]; to be torn [in two]'), *vieremä* 'cave-in; slip, slide; falling ground, fallen ground, fallen rocks' (*vieri-* 'to roll; to fall in, to give way; to fall down, to slide, to glide, to slip'), *voima* 'strength, power' (*voi-* 'to be able, to have power, to know how to'); (b) in Finnish,

derivatives in *-ma* ~ *-mä* often function as passive participles (with the agent in the genitive): cf. Finnish *ensimmäinen suomalainen kielioppi ruostsalaisen krijoittama* 'the first Finnish grammar was written by a Swede'; (c) in Lapp / Saami, the counterpart of Finnish *-ma* ~ *-mä* forms action nouns: cf. Lapp / Saami *ælem* 'life', *japmem* 'death', *kállem-pái'hke* 'ford' (*kálle-* 'to wade, to ford a river' + *pái'hke* 'place'), *saddjem* 'whetstone' (*saddje-* 'to hone'). Mordvin has two suffixes: (a) **-ma* (without vowel harmony) and (b) **-mõ* ~ **-mə*. Suffix (a) forms concrete nouns (cf. Erza *veškuma* 'pipe, whistle' [*veška-* 'to whistle'], *čapavtuma* 'ferment, leaven, yeast' [*čapavto-* 'to ferment, to make sour']), while suffix (b) is found mainly in abstracts (cf. *simeme tarka* 'drinking place' [*sime-* 'to drink']). Suffix (a) also forms action nouns which function as passive participles and gerunds, as in *nilima* '(the activity of) swallowing, swallowed (participle), one must swallow', whereas suffix (b) forms the infinitive. In Cheremis / Mari, *-m* suffixes form (a) deverbative nouns (cf. *koem* 'woven ribbon' [*koe-* 'to weave']), (b) action nouns, and (c) past participles in *-mõ*, *-mə* (cf. *šüwər šoktəmə* 'bagpipe playing', *jõratəmə* 'loved, beloved', *komõ* 'woven', *kaymə* 'gone'). In Vogul / Mansi, *-m* suffixes form (a) action nouns and (b) participles (cf. *uuləm* 'sleep', *minəm* 'gone [or going]', *wäärəm* 'made'). In Ostyak / Xanty, *-m* suffixes form (a) action nouns and (chiefly past) participles (cf. *uləm* 'sleep, dream', *mănəm* 'gone'). *-m* suffixes are rare in Hungarian — a few examples include: *álom* 'sleep' (*al-* 'to sleep'), *öröm* 'joy, pleasure' (*örül-* 'to rejoice, to be glad'). In Yurak Samoyed / Nenets, *-ma*, *-me* form (a) action nouns (cf. *kaema* '[the act of] going [away]') and (b) participles that function in passive constructions in the same way as Finnish participles in *-ma* ~ *-mä* (cf. *toondamaw jaw* 'the place I covered' [*toonda-* 'to cover', *-w* = 1st sg. personal ending]). Collinder also (1960:260) reconstructs Proto-Uralic **m* and notes: "[t]his is a typical stem determinative. It may be historically identical with the deverbative noun-formant **m*…" See also Raun 1988b:566: "Richly represented is the suffix **-mV* which has several meanings…"

F. Altaic: A suffix *-m* is used to form verbal nouns in Turkic (cf. Greenberg 2000:172). This includes passives in *-ma*/*-me*, as in Turkish *yaz-ma* 'written' and *der-me* 'collected, gathered together', and the common infinitives in *-mak*/*-mek*, as in Turkish *bur-mak* 'to twist' and *sil-mek* 'to wipe, to scrub, to plane, to rub down, to polish'. Décsy (1998:62—66) also lists Old Turkish (a) *-m* denominal substantive builder identical with the possessive ending first person singular in addresses and titles, (b) *-ma*/*-mä* rare deverbal substantive builder (more frequently adjective), (c) *-ma*/*-mä* rare deverbal adjective builder, (d) *-maq*/*-mäq* deverbal substantive builder for abstract concepts, (e) *-maz*/*-mäz* deverbal substantive builder for negative nouns used mainly in predicative function, (f) *-myr*/*-mur* rare deverbal substantive builder, (g) *-myš*/*-miš*/*-maš*/*-mäš*(/*-muš*/*-miš*) deverbal substantive builder for nouns used mainly in predicative function, tense-indifferent, active or passive, (h) *-ym*/*-im*/*-am*/*-äm* deverbal substantive builder, (i) *-maz*/*-mäz* deverbal adjective builder, used as predicate noun in connection with negation, and (j) *-myš*/*-miš*/*-maš*/*-mäš*

(/-*muš*/-*miš*) deverbal adjective builder used mainly as a predicate noun. In Mongolian, -*m* serves as the basis for several converb suffixes (cf. Poppe 1955:280—281): (a) Written Mongolian -*maγča*, Modern Mongolian -*maγ*/-*meg*, which indicates an action simultaneous with the main verb (cf. Mongolian *qaγurmaγ* 'fraud, deceit' from *qaγur*- 'to deceive' and *egedemeg* 'a kind of sour dough' from *egede*- 'to become sour') and (b) Buriat -*mγā̃*, Mongolian -*mγai*, Ordos -*maəā̃*, Khalkha -*maəᵘē*/-*məᵘē*, Kalmyk -*mγā̃*, which indicates the idea of the ability to perform the action in question (cf. Mongolian *surumγai* 'able to learn' from *sur*- 'to learn'). In Tungus, this suffix is found in the simultaneous verbal participle in -*mi* as well as verbal nouns in -*ma* in Oroch and the Manchu verbal suffix -*me* indicating that the action is simultaneous with the main verb (cf. Greenberg 2000:172).

16.40. Nominalizer *-*y*- (Greenberg: §38. Nominalizer I; see also Bomhard—Kerns 1994:169)

This suffix was a common nominalizer. In Afrasian, it could also be added to nominals to form attributives (adjectives). It was particularly productive in Indo-European.

A. Afrasian: Ehret (1995:16) reconstructs an attributive deverbative and attributive noun suffix **y* (**-ay*-, **-iy*-) for Proto-Afrasian. He notes: "[t]his suffix can operate as a noun-forming deverbative in Semitic, Egyptian, Chadic, and Cushitic instances, but is also often added to nominals to form attributives — names of things having the attribute(s) of, or associated by location or resemblance with, the item named by the stem to which **y* is suffixed." In Semitic, the suffixes -*īy* and -*āy* produce adjectives with the meaning 'belonging to': cf., for example, Arabic *ʾarḍīy* 'terrestrial'; Akkadian *maḫrū* (< **maḫrīyu*) 'first'; Biblical Aramaic *Kaśdāy* 'Chaldean'; Hebrew *Yəhūḏī* 'Jewish'; etc. (cf. Moscati 1964:83, §12.23; Lipiński 1997:223—225). In West Semitic, the prefix *ya*- is confined to the names of animals and (infrequently) plants: cf. Arabic *yaḥmūr* 'a kind of antelope', *yabrūḥ* 'mandrake' (cf. Moscati 1964:80, §12.15; Lipiński 1997:216). It is also used to form adjectives: cf. Arabic *yaḥmūm* 'black'. In Egyptian, the suffix -*y* is used to form adjectives from nouns or to form prepositions: cf. (a) adjectives: *Ḥr Nḫny* 'Horus of Nin', *rsy* 'southern', *mḥyty* 'northern'; (b) prepositions: *ỉry* 'relating to, connected with', *ḫry* 'above', *ỉmy* '(who is) in' (cf. Gardiner 1957:61—63, §§79—80). Like other adjectives, those ending in *y* are often used as nouns: cf. *ḥmy* 'steersman' (*ḥm* 'to steer'), *rḫty* 'washerman' (*rḫt* 'to wash'), *sḫty* 'peasant' (cf. Gardiner 1957:63, §81). Ehret (1980:61—62) lists a great variety of Southern Cushitic noun suffixes in *-*Vy*-: (a) noun singular suffixes: Proto-Southern Cushitic *-*aya* > Iraqw, Burunge -*aya*, K'wadza, Asa -*aya*, Ma'a -*aye*, Dahalo -*aaja*; Proto-Southern Cushitic *-*aye* > Iraqw, Burunge -*aye*, Ma'a -*aye*; Proto-Southern Cushitic *-*ayi* (masculine) > Iraqw, Burunge,

Alagwa *-ayi*, K'wadza *-ayi*, Ma'a *-(V)yi*; Proto-Southern Cushitic **-ayo* (masculine) > Alagwa *-ayo* (also *-ayu*), K'wadza, Asa *-ayo*, Dahalo *-ajo*, *-adzdzo*; Proto-Southern Cushitic **-iya* (feminine) > Burunge, Alagwa *-iya*, K'wadza *-iya*, Asa *-iya* (also *-iya* plural suffix), Ma'a *-(y)e*; Proto-Southern Cushitic **-iye* (feminine) > Iraqw *-iye*, K'wadza *-iye*, Ma'a *-(i)ye*; Proto-Southern Cushitic **-iyo* (feminine) > Burunge *-iyo*, K'wadza, Asa *-iyo*, Dahalo *-ijo* (rare); Proto-Southern Cushitic **-oy-* > K'wadza *-oyi*, Asa *-oye*, Dahalo *-ooja* (rare); (b) noun plural suffixes: Proto-Southern Cushitic **-aye* > K'wadza *-aye*, Ma'a *-aye* in *gomaye* 'cloth' (which occurs in quantity rather than number)'; Proto-Southern Cushitic **-ayi* > Iraqw, Burunge *-ay*, Ma'a *-ai* in *atakai* 'riddle'; Proto-Southern Cushitic **-ayu* > Asa *-ay-* in complex *-ayuko*, Ma'a *-ayu* in names of things that occur in mass/quantity, as in *šwaɣayu* 'dry grass', Dahalo *-aju* (frequent). Ehret (1980:62) also lists the following adjective suffixes: Proto-Southern Cushitic **-ayi* > K'wadza *-ayi*, Ma'a *-(V)yi*; Proto-Southern Cushitic **-iye* > Burunge *-i*, Ma'a *-(i)ye*.

B. Dravidian: Krishnamurti (2003:199) reconstructs a Proto-Dravidian suffix **-ay* which was added to monosyllabic verb roots to form verbal nouns: cf. **wil-ay* 'price' (**wil-* 'to sell') > Tamil *vil-ai* 'selling, sale, price, cost' (*vil-* 'to sell'); Malayalam *vil-a* 'sale, price, value'; Kannaḍa *bil-i*, *bel-e* 'price'; Kota *vel* 'price, cost'; Telugu *vel-a* 'price'; Koḍagu *bel-e* 'cost'; Tuḷu *bil-è*, *bel-è* 'price, value, worth' (cf. Burrow—Emeneau 1984:492, no. 5421); **kaṭṭ-ay* 'dam' (**kaṭṭ-* 'to tie, to bind') > Tamil *kaṭṭ-ai* 'dam' (*kaṭṭu* 'to tie, to fasten, to build'); Kannaḍa *kaṭṭ-e* 'structure of earth or stones to sit upon, embankment, dam, causeway'; Tuḷu *kaṭṭ-a* 'dam, embankment'; Naikṛi *kaṭṭ-a* 'bund of field, dam, dike'; Gondi *kaṭṭ-a* 'bund, embankment' (cf. Burrow—Emeneau 1984:108, no. 1147).

C. Kartvelian: Klimov (1998:80) reconstructs Proto-Kartvelian **-ia* nominal diminutive affix (> Georgian *-ia*, Mingrelian *-ia*), while Fähnrich—Sardshweladse (1995:177) reconstruct Proto-Kartvelian **-i* nominal suffix (> Georgian *-i*, *-j*; Mingrelian *-i*; Laz *-i*; Svan *-i*, *-j*) — examples include: Georgian *k'ac-i* 'man', *saxl-i* 'house', *ʒma-j* 'brother'; Mingrelian *k'oč-i* 'man', *osur-i* 'wife'; Laz *k'oč-i* 'man', *inč'ir-i* 'elder'; Svan *mag-x-i* 'all, every', *jerx-i* 'some', *č'alä-j* 'river, stream', *dä-j* 'sister-in-law, husband's sister'.

D. Indo-European: A deverbal suffix **-i-* has been reconstructed for Proto-Indo-European (cf. Brugmann 1904:348—349; Burrow 1973:176—187; Greenberg 2000:167—168), while the suffix **-yo-* was commonly used to produce adjectives from verbal stems (cf. Brugmann 1904:318; Burrow 1973:185; Lindsay 1894:318—321; Palmer 1980:254—255). Burrow (1973:185) notes specifically: "The suffix [**-yo-*], originating in this way, became widespread at an early period producing adjectives meaning 'belonging to…, connected with'." We can cite a few examples from Sanskrit to illustrate the general patterning: cf. *div-yá-ḥ* 'heavenly' (cf. Greek δῖος 'god-like, divine'), *sat-yá-ḥ* 'true', *grām-yá-ḥ* 'of the village', *rāj-yá-ḥ* 'royal, regal' (cf. Latin *rēgius* 'royal, regal'), *som-yá-ḥ* 'relating to soma', *pítr-ya-ḥ*, *pítri-ya-ḥ* 'paternal' (cf.

Greek πάτριος ‘of or belonging to one’s father’, Latin *patrius* ‘of or relating to a father, fatherly, paternal’), *nár-ya-ḥ* ‘manly’, etc.

E. Uralic: Collinder (1960:264, §792, and 1965:110) reconstructs a Proto-Uralic deverbative suffix **-ya* ~ **-yä*, which “seems to have formed *nomina actoris* (*agentis*) and participles in PU”: cf. Finnish *ostaja* ‘purchaser’ (*osta-* ‘to buy, to purchase’); Lapp / Saami *puol'le* ‘burning’ (Southern *buollëjë*), present participle of *puolle-* ‘to burn (intr.)’; Mordvin *palaj-* ‘kissing’, present participle of *pala-* ‘to kiss’; Yurak Samoyed / Nenets *taalej* ‘thief’ (*taale-* ‘to steal’), *jœhoraj* ‘lost’ (*jœhora-* ‘to lose’); Selkup Samoyed *sit'aj-* ‘liar’ (cf. Yurak Samoyed / Nenets *siije-* ‘to lie, to tell lies’). Collinder also (1960:257) reconstructs a Proto-Uralic formant **y*, noting that “it is impossible to say what function it had from the beginning”, but that, “[i]n some of the F[inno-] U[grian] languages, it occurs in diminutives or words with a tinge of familiarity (designations of near relatives, and the like)…” Décsy (1990:60—61) attributes the following functions to the suffix **-ya* ~ **-yä*: (a) denominal noun, (b) deverbal noun, (c) denominal verb, and (d) deverbal verb. According to Raun (1988b:566), in Proto-Uralic, “[t]he suffix **-jV* seems to have been used preferably to designate the actor.”

F. Altaic: The deverbal suffixes *-yaq*/*-yäk*, *-ayaq*/*-äyäk* are found in Old Turkish (cf. Décsy 1998:65). However, they are extremely rare. Greenberg (2000:168) also notes that “[a]s a formative for verbal nouns *i* is also found in all branches of Altaic, although it is no longer productive in Mongolian (Ramstedt 1952, II: 100—2).” Likewise, Poppe (1955:264): “The verbal noun in **i* occurred in Common Altaic, cf. Turk. *qaršï* ‘obstacle, against’ (from *qariš-* ‘to resist’), *qonšu* ~ *qonšï* ‘neighbour’ (from *qoniš-* ‘to spend nights together’), Tungus *suli* ‘sharp, sharpened’ (from *sul-* ‘to sharpen’ e.g., a pencil), *dęgī* ‘bird’ (from *dęg-* ‘to fly’), Korean *nophi* ‘height’ (from *noph-* ‘to be high’), etc.” For Mongolian, Poppe (1955:264) mentions that “[t]he primary suffix **i̯* still occurs in a few forms of verbal nouns, e.g., Mo. *ajisui̯* ‘approaching’ (as a predicate ‘he approaches’), *odui̯* ‘going away’ (‘he goes away’), *bui̯* ‘existence, existing’ (‘is’), *bolui̯* ‘he is, he becomes’, etc. The verb *bol-* occurs also in the form *bolai̯* ‘he is’. In Pre-classical Written Mongolian and in Middle Mongolian more forms ending in *-i̯* occurred as predicates, e.g., Mo[ngolian] *kemegdei̯* ‘it is said’.” “Other petrified forms in *-i̯* are Mo[ngolian] *γarui̯* ‘exceeding’, *darui̯* (Kh[alkha] *dar^{u}ī*) ‘immediately’ (from *daru-* ‘to press’), Mo[ngolian] *baγurai̯* ‘weak, backward, underdeveloped’ (from *baγura-* ‘to become weak, to be in a state of decay, to go down’), etc.”

16.41. Nominalizer **-t^h-* (not in Greenberg 2000; but Greenberg does posit the following: §43. Passive Participle T; see also Hegedűs 1992b:41—42 **t*: suffix forming deverbal or denominal nouns, mainly abstracta; Dolgopolsky 2008, no. 2311, **ṭi* syntactic particle; it is combined with words of verbal meaning to build analytical nomina actionis; Bomhard—Kerns 1994:170); also see below: participle **-t^ha*.

A. Afrasian: Ehret (1995:16—17) notes that a "noun formative in *t is well attested all across the Afroasiatic family." "It appears to have been especially productive in Egyptian, … forming noun instruments, attributives, and complements from verbs as well as deriving nouns from other nouns of related or associatable meanings. This latter function has also been observed in Cushitic derivations…" Ehret (1995:17) also reconstructs an adjective suffix *-*t*. According to Ehret, this suffix "is prominent in Cushitic and is more weakly attested in Egyptian, Semitic, and apparently Omotic." In Semitic, the suffixes *-ūt*, *-īt* produce abstract stems: (a) *-ūt*: Akkadian *šarrūtu* 'kingship', Hebrew *malχūθ* 'kingship', Syriac *daχyūθā* 'purity', Geez / Ethiopic *ḫīrūt* 'goodness'; (b) *-īt*: Hebrew *rēšīθ* 'beginning', Punic *swyt* 'curtain', Syriac *ʿərawwīθā* 'fever', Biblical Aramaic *ʾaḥărīθ* 'end' (cf. Moscati 1964:83, §12.24). The suffix *-āt* occurs in Geez / Ethiopic as well: cf. *naʾasāt* 'youth', *ḳədsāt* 'holiness'. In Semitic, the prefixes *ta-*/*ti-*/*tu-* mostly produce nouns derived from verbal stems: cf. Arabic *tardād* 'repeating', *tibyān* 'explaining'; Akkadian *tallaktu* 'going'; Geez / Ethiopic *tafṣām* 'completing'; Ugaritic *trmmt* 'offering'; etc. (cf. Moscati 1964:81, §12.17; Lipiński 1997:219—220). An infix *-t-* is also found in Akkadian and Amorite, where it is used to create adjectives with intensive meaning: cf. *gitmālu(m)* 'perfect', *pitluḫu(m)* 'awful' (cf. Lipiński 1997:220). Egyptian also forms nouns by means of a *t*-suffix: cf. *m-sdm-t* 'black eye-paint' (*sdm* 'to paint [the eyes]'). Ehret (1980:53—55) lists a great variety of Southern Cushitic nominal suffixes in *-*Vt*-: (a) noun singular suffixes in *-*Vt*-: Proto-Southern Cushitic *-*ata* > Iraqw, Burunge, Alagwa *-ata* (also Iraqw *-ate*), Ma'a *-ate*, Dahalo *-at̲t̲a*; Proto-Southern Cushitic *-*ati* > Iraqw *-(a)ti*, K'wadza *-ati*, Asa *-aš(i)*, Ma'a *-ati*, Dahalo *-at̲i*; Proto-Southern Cushitic *-*atu* (masculine) > Alagwa *-atu*, K'wadza, Asa *-atu*, Ma'a *-atu*, Dahalo *-at̲u*; Proto-Southern Cushitic *-*eete* > K'wadza *-et-* in complexes *-etuko*, *-etito*, Asa *-ete*, Dahalo *-ee t̲e*; Proto-Southern Cushitic *-*eta*, *-*eto* > Iraqw, Burunge *-ita*, K'wadza *-ita*, *-ito*, Asa *-ita*, *-ida*, Ma'a *-ito*, Dahalo *-it̲a* (cf. also *-it̲e*); (b) suffixes in *-*Vt*- for deriving nouns from other nouns: Proto-Southern Cushitic *-*eta* > Burunge *-eta*, Asa *-eta* suffix on both nouns and adjectives, Ma'a *-eta*; Proto-Southern Cushitic *-*eto* > Iraqw *-eto*, K'wadza *-eto*, Asa *-et*, Ma'a *-eto*, Dahalo *-et̲t̲o*; Proto-Southern Cushitic *-*ota* > Asa *-ota* in *ʾajota* 'day' (< **ʾaj-* 'sun'), Ma'a *-ota* in *kadota* 'perhaps' (< **kaḏ-* 'then'); (c) noun particularizing suffixes in *-*Vt*-: Proto-Southern Cushitic *-*itu* (masculine ?) > Iraqw *-itu*, *-it-* in *-itoʾo* feminine particularizing suffix, Burunge *-itu*, Asa *-Vt-* in complex *-Vtok*, *-Vtuk*, Ma'a *-(i)tu*, Dahalo *-ittu* singular of ethnic names (Ehret notes that the use of *-*itu* to singularize ethnic names probably goes back to Proto-Southern Cushitic since that usage also turns up in West Rift in *Iraqutu* 'one Iraqw person'); Proto-Southern Cushitic *-*otu* > Burunge *-otu*, Dahalo *-ot̲t̲u*; (d) adjective suffixes in *-*Vt*-: Proto-Southern Cushitic *-*ate* > Iraqw, Alagwa *-at*, Burunge *-adi*, K'wadza *-at(i)-*, Asa *-aš(i)*, Ma'a *-a*, Dahalo *-at̲e*; Proto-Southern Cushitic *-*ite* (rare) > Iraqw *-it*, Burunge *-d* in *qadayd* 'bitter' (**qadayit-*), Dahalo *-iit̲e* in *ᵐbiit̲ee* 'bad'; (e) plural suffixes in *-*Vt*-: Proto-Southern Cushitic *-*ata* > Iraqw *-ta* in *qarta*,

plural of *qari* ‘age-mate’, *-t* adjective plural, K’wadza *-ata*, Asa *-at-* in complexes of the form *-atVk*, Dahalo *-Vtta*; Proto-Southern Cushitic *-*etu* > K’wadza *-etu*, Dahalo *-ettu*; Proto-Southern Cushitic *-*ota* > Asa *-ot-* in complexes *-otVk*, Dahalo *-Vtta*; Proto-Southern Cushitic *-*uta* > Asa *-ut*, Dahalo *-Vtta*.

B. Elamo-Dravidian: Note the Elamite derivational suffix *-t(e)* (cf. Khačikjan 1998:12; Grillot-Susini 1987:14): cf. *hal-te* ‘door’, *hala-t* ‘brick’, *Haltam-ti* ‘Elam’, *Nahhun-te* ‘Sun’. Krishnamurti (2003:199) reconstructs two Proto-Dravidian compound deverbal suffixes: (a) *-*t-al*/*-tt-al* and (b) *-*t-am*, which are added to roots ending in *-*ṭ*: cf., for example, Tamil *ōṭṭu* (< *oṭ+t-; cf. *ōṭu* ‘to run [intr.]’) ‘to cause to run (tr.)’, *ōṭ-ṭ-am* (< *oṭ+t-am) ‘running’; cf. also Kannaḍa *kūṭ-am* (< *kūṭ+t-am; cf. *kūḍu* ‘to join’) ‘union’, *pāṭ-am* (< *pāṭ+t-am; cf. *pāḍu* ‘to sing’) ‘song’. Krishnamurti (2003:200) also reconstructs two other Proto-Dravidian complex noun formatives: (a) *-*am+t+am* (cf. Tamil *opp-antam* ‘agreement, contract, unanimity’; Malayalam *opp-antam* ‘agreement, contract’; Kannaḍa *opp-anda* ‘agreeing, agreement, contract’; Telugu *opp-andamu* ‘contract, agreement’; Tuḷu *opp-anda* ‘agreement, contract, treaty’) and (b) *-*t+al+ay* (cf. Telugu *oppu-dala* ‘agreement’; Kannaḍa *tavu-dale* ‘destruction’ [cf. *tavu* ‘to decrease’]). These are obviously extensions of the *-*t-* nominalizer under discussion here.

C. Kartvelian: Klimov (1998:46) reconstructs Proto-Kartvelian *-*et* toponymic suffix. It is found mostly in the names of villages and regions: cf. Georgian *-et-* toponymic suffix as in: *Ḳviriḳ-et-*, *Tuš-et-*, *ǯoǯox-et-* ‘hell’; Mingrelian and Laz *-at-* toponymic suffix as in: *Zan-at-*, *Max-at-*; etc. Cf. also Fähnrich—Sardshweladse 1995:121; Fähnrich 1994:240 and 2007:146—147.

D. Indo-European: Nominal/adjectival-forming suffixes in *-*t*^{h}- are extremely productive in Indo-European. For details, cf. Brugmann 1904:315 (*-*ent-*, *-*nt-*, *-*n̥t-*), 317—318 (*-*to-*), 321 (*-*tero-*), 322 (*-*is-to-*, *-*tm̥mo-*), 325 (*-*to-*), 326 (-*tn̥no-*, *-*tno-*), 330—331 (*-*(t)er-*, *-*(t)or-*, *-*(t)r-*, *-*(t)r̥-*), 332—333 (*-*ter-*, *-*tor-*, *-*tr-*, *-*tr̥-*), 334—335 (*-*tro-*, *-*ter-*, *-*tor-*, *-*trā-*), 335 (*-*tro-*), 344—345 (*-*to-*, *-*tā-*), 348—349 (*-*ti-s*), 349—350 (*-*tu-s*), 350 (*-*tāti-*, *-*tāt-*, *-*tūti*, *-*tūt-*); Burrow 1973:164—173. According to Burrow (1973:164), “[i]ts original function as one of the primary neuter suffixes is seen most clearly when it serves as an extension of the neuter *r-* and *n-* stems, e.g. in Skt. *śákṛt*, *yákṛt* and in Gk. χεῖμα, gen. sg. χείματος ‘winter’ (but the corresponding *-nt-* stem in Hittite, *gimmant-* ‘winter’, is common gender). Similarly the primitive suffix *t* on which the suffix *-t-ar* has been built may be presumed to have been neuter. Apart from this there remain in the various languages a few sporadic instances of a neuter suffix *t*: Skt. *pŕśat-* ‘drop’, *upatá-pat-* ‘fever’; Gk. μέλι (for *μέλιτ), Hitt. *milit* ‘honey’; Gk. γάλα, γάλακτος, Lat. *lac*, *lactis* ‘milk’; Lat. *caput* ‘head’.” Examples from Sanskrit include: (a) adjectives in *-*t*^{h}*o-s*: *darśatá-ḥ* ‘visible’ (cf. Greek ˚δέρκτος), *tŕṣṭá-ḥ* ‘rough’, *śyetá-ḥ* ‘white’; (b) action nouns in *-*t*^{h}*i-s*: *kṣíti-ṣ* ‘destruction’ (cf. Greek φθίσις), *ā́-huti-ḥ* ‘oblation’ (cf. Greek χύσις), *pluti-ḥ* ‘floating’ (cf. Greek πλύσις), *tati-ḥ* ‘stretching, row’ (cf. Greek τάσις); (c) agent nouns in

*-t^h*i-s*: *jñātí-ḥ* ‘relation’ (cf. Lithuanian *gentìs*), *sápti-ḥ* ‘steed’, *srutí-ḥ* ‘flowing’ (cf. Greek ῥύσις), *rātí-ḥ* ‘liberal’, *sthapáti-ḥ* ‘governor; architect’; (d) neuters in *-t^h*u-*: *vā́stu* ‘abode’ (cf. Greek [Ϝ]άστυ ‘city’), *dā́tu* ‘division’, *vástu* ‘thing’, *mástu* ‘sour cream’; (e) masculines in *-t^h*u-s*: *dhā́tu-ḥ* ‘element’, *sótu-ḥ*‘libation’; (f) agent nouns and adjectives in *-t^h*u-s*: *mántu-ḥ* ‘councilor’, *tapyatú-ḥ* ‘glowing’; (g) neuters in *-t^h*wo-s*: *devatvá-ḥ* ‘divinity’; (h) *-t^h*āt^h*-: *devátāt-* ‘godliness’, *sarvátāt-* ‘completeness’ — the same suffix appears in Avestan (cf. *haurvatāt-* ‘wholeness’), Greek (cf. βαρύτης ‘heaviness’), and Latin (cf. *civitās* ‘citizenship’); etc. The specialized use of *-t^h*o-* as a participle ending will be discussed below.

E. Uralic: According to Collinder (1960:271 and 1965:115), **t* was used to form infinitives and participles in Fennic, Lappish, Ob-Ugric, and Samoyed: cf. Finnish (lative) *juota* (dial. *juotak*) ‘to run’; Lapp / Saami (Lule) (infinitive) *mannat* ‘to go’; Ostyak / Xanty infinitive ending *-taŭə* (this may be identical with the ending *-ta[k]* ~ *-tä[k]* of the Finnish [lative case of the] infinitive); Yenisei Samoyed / Enets (Baiha) *jebide* ‘drunk’ (*jebi-* ‘to be drunk’). Décsy (1990:65) reconstructs Proto-Uralic *-*tya*/*-*tyä* used to form denominal nouns and deverbal verbs. For the Proto-Uralic suffix *-*ta*/*-*tä*, he (1990:64—65) attributes denominal verbal and deverbal verbal functions.

F. Altaic: Décsy (1998:62—66) lists various Old Turkish denominal *t*-suffixes: (a) *-t* denominal substantive builder, (b) *-ta*/*-tä* very rare adjective builder, and (c) *-t-*(*/-yt*/*-ut*/*-üš*) deverbal substantive builder. Turkic denominal *t*-suffixes are also discussed by Menges (1968b:159 and 163): cf. Uighur *bošγu-t* ‘teaching’ (**bošγu-* in *bošγu-n-* ‘to learn’), *ur-un-t* ‘offense’ (*ur-un-* ‘to fight’); Chagatay *bin-üt* ‘riding animal’ (*bin-* ‘to mount’). Manchu has the nominalizing suffixes *-ta* and *-tai* (cf. Sinor 1968:261): cf. *ilate* ‘three by three’ (*ilan* ‘three’), *šanggatai* ‘finally, indeed, actually; fully at an end, thoroughly completed’ (*šangga-* ‘to come to an end, to terminate successfully, to finish’, *šanggan* ‘completion, accomplishment’).

G. Gilyak / Nivkh: Nouns can be derived from finite verb forms by means of the suffixes: (Amur) *-d′*/*-t′*, (East Sakhalin) *-d*/*-nd*/*-nt* (cf. Gruzdeva 1998:22): cf. Amur *lud′* ‘singing’, *p^herd′* ‘tiredness’, etc.

16.42. Nominalizer *-*n*- (not in Greenberg 2000; but Greenberg does posit the following: §42. Passive Participle N; Illič-Svityč 1971—1984.I:16 *-*na*; see also Bomhard—Kerns 1994:170; Hegedűs 1992b:37—41 **na*: formative of verbal and relative constructions); see below: participle *-*na*.

A. Afrasian: According to Ehret (1995:17—18), “[a]nother nasal, *n, also functioned as an attributive suffix, but its scope more closely paralleled that of the *y attributive (q.v.). Like *y, it appears frequently to have produced adjectives from verbs or nouns. It is known from all branches of the family. Its Semitic reflex appears to have been *-ān.” In Semitic, the suffix *-*ān* is used to create (a) verbal nouns or abstracts (cf. Arabic *ṭayarān* ‘flight’; Hebrew

[**pitrān* >] *piθrōn* ‘interpretation’; Syriac *puḳðānā* ‘order’; Epigraphic South Arabian *ʔḫwn* ‘brotherhood’; Geez / Ethiopic *rəšān* ‘old age’); (b) adjectives (cf. Arabic *sakrān* ‘intoxicated’; Hebrew [**ḳadmān* >] *ḳaðmōn* ‘eastern’; Syriac *ʔarʿān* ‘terrestrial’); and (c) diminutives (cf. Arabic *ʿaḳrabān* ‘little scorpion’; Hebrew [**ʔīšān* >] *ʔīšōn* ‘[little man >] pupil [of the eye]’; Akkadian *mīrānu* ‘little animal’) (cf. Moscati 1964:82, §12.21; Lipiński 1997:221—223). In Akkadian, prefix *n-* either (a) alternates with prefix *m-*, in which case it cannot be considered an independent category, or (b) is used to derive deverbal nouns (cf. *namungatu* ‘paralysis’, *nalbubu* ‘enraged’, etc.) — a possible non-Akkadian example may be found in Ugaritic *nblȧt* ‘flames’ (cf. Moscati 1964:81—82, §12.19; Lipiński 1997:218—219). Ehret (1980:55—56) lists several Southern Cushitic nominal suffixes in **-Vn-*: (a) noun singular suffixes in **-Vn-*: Proto-Southern Cushitic **-ana* > Burunge *-ana*, Iraqw *-an* adjective suffix, K’wadza *-an-* in complex *-aniko*, *-an-* adjective suffix, Asa *-ana*, Ma’a *-(a)na*, *-(a)ne*, Dahalo *-ana*, *-anna*; Proto-Southern Cushitic **-ano* (feminine) > Iraqw *-ano*, Dahalo *-(a)no*; Proto-Southern Cushitic **-eno* > Iraqw, Burunge *-eno* (also *-ino*), Alagwa *-inu*, Asa *-en(d)-* in complex *-endet* (also *-ena*), K’wadza *-ino*, Ma’a *-(e)no* (also *-(e)nu*), Dahalo *-eno* (cf. also *-eeni*); Proto-Southern Cushitic **-ina* > Burunge *-ina*, Dahalo *-ina* (cf. also *-iini*); Proto-Southern Cushitic **-oni* > Iraqw *-oni*, Dahalo *-oni*; Proto-Southern Cushitic **-ona* > Burunge *-ona*, Alagwa *-onda* (also *-ono*), Dahalo *-ona* (also *-una*); (b) plural suffixes in **-Vn-*: Proto-Southern Cushitic **-ena* > Iraqw, Burunge *-en* adjective plural, Iraqw *-(V)na*, K’wadza *-Vn-* in complexes *-VnVk-*, *-en(d)-* in complex *-endayo*, Asa *-Vn(d)-* in complexes *-VndVk*, Ma’a *-ena*, Dahalo *-eena*; Proto-Southern Cushitic **-eno* > Burunge *-eno*, K’wadza *-Vn-* in complexes *-VnVk-*, *-en(d)-* in complex *-endayo*, Asa *-Vn(d)-* in complexes *-VndVk*, Ma’a *-no* suffix attached to nouns indicating a great number or quantity.

B. Elamo-Dravidian: Elamite had the following derivational suffixes: *-in*, *-un*, *-n*. “These suffixes were part of neutral nouns with a weakly expressed abstract meaning, often connected with building or locality…” (cf. Khačikjan 1998:12): cf. Elamite *muru-n* ‘land’, *siya-n* ‘temple’, *huhu-n* ‘wall’, *Šuša-n* ‘Susa’, *šati-n* ‘priest’. According to Krishnamurti (2003:307), “Old Tamil is said to have *-un*/*-n-* used as adjectival formatives, followed by personal suffixes in deriving predicative nouns in the third human plural, e.g. *ceppu-n-ar* ‘those who tell’, *varu-n-ar* ‘those who come’, *tu̲rakk-un-ar* ‘those who renounce’, *ī-n-ar* ‘those who give’, etc.”

C. Kartvelian: Proto-Kartvelian **na-* word-formation affixes of the past participle > Georgian *na-* (as in *na-p’arev-* ‘stolen’, *na-t’ex-* ‘broken, broken off’, *na-šob-* ‘born’); Mingrelian *no-*; Laz [*no-*]; Svan *na-*. Proto-Kartvelian **ne-* word-forming prefix > Georgian [*ne-*] (as in *ne-zv-* ‘female of small livestock’, *ne-k’erčxal-* ‘maple tree’, *ne-rg-* ‘sapling, seedling’, *ne-rc’q’v-* ‘saliva, spittle’, *ne-st’o-* ‘nostril’); Mingrelian [*na-*]; Laz [*na-*]; Svan [*ne-*, *nä-*]. Proto-Kartvelian **ni-* word-forming prefix > Georgian [*ni-*] (as in *ni-k’ap’-* ‘chin’); Mingrelian [*ni-*]; Laz [*ni-*]; Svan [*ni-*]. Cf. Klimov 1998:136, 140, and 142; Fähnrich—Sardshweladse 1995:259, 262, and 265; Fähnrich 1994:240 and 2007:312, 316,

320. Hegedűs (1992b:40) also mentions Georgian *-n-* element of adjective-forming suffixes, as in *c'ver-ian-i* 'bearded'. Note also Fähnrich (2007:36) and Fähnrich—Sardshweladse (1995:34) Proto-Kartvelian **-an* derivational affix > Georgian *-an* (in the combinations *-ev-an*, *-e-an*, *-i-an*, *-ov-an*, *-os-an*); Mingrelian *-on*; Laz *-on*.

D. Indo-European: **-n-* suffixes figure prominently in nominal derivation in Indo-European. For details, cf. Brugmann 1904:315 (**-ent-*, **-nt-*, **-n̥t-*), 316 (**-meno-*, **-mno-*), 316—317 (**-n-*: **-eno-*, **-ono-*, **-no-*), 325 (**-no-*), 325—326 (**-ino-*, **-īno-*), 326 (**-tn̥no-*, **-tno-*), 338 (**-īno-*, **-eino-*), 339—340 (**-en-*, **-on-*), 345 (**-no-*, **-nā-*), 347—348 (**-men-*), and 349 (**-ni-s*); Burrow 1973:127—158 (Burrow discusses **-r-* and **-n-* formations together). Examples include: (a) Proto-Indo-European **-en-t^h-*/**-on-t^h-*/**-n-t^h-*/**-n̥-t^h-*: Sanskrit *sánt-*, *sát-* 'being', *bhárant-*, *bhárat-* 'bearing'; Greek (Doric) ἔντ-ες 'being', φέρων (-οντος) 'bearing'; Latin *-sēns* in *prae-sēns* 'being before, presiding over', *ferēns* 'bearing'; Gothic *bairands* 'bearing'; (b) Proto-Indo-European **-me-no-*, **-m-no-*: Sanskrit middle passive participle *-māna-* in, for example, *bódha-māna-ḥ* (cf. *bodháti* 'is awake, observes, notices, understands', root: *budh-*); Greek middle passive participle -μενο- in, for example, πευθό-μενο-ς (cf. πεύθομαι 'to learn of, to hear of'); Latin *fē-mina* 'woman, female' (that is, 'she who suckles'); (c) Proto-Indo-European: **-e-no-*/**-o-no-*/**-no-*: Sanskrit *dā́-na-m* 'the act of giving; donation, gift', *bhára-ṇa-m* 'the act of bearing'; Latin *dō-nu-m* 'gift'; Gothic (inf.) *baira-n* 'to bear', *fulg-in-s* 'hidden'; Old Church Slavic *nes-enъ* 'borne'; (d) Proto-Indo-European **-no-*: Sanskrit *pūr-ṇá-ḥ* 'filled, full', *sváp-na-ḥ* 'sleep, dream', *rac-ana-m* 'an arranging, regulating'; Avestan *kaēnā* 'punishment'; Gothic *fulls* (< **ful-na-z*) 'filled, full'; Lithuanian *pìl-na-s* 'filled', *vár-na-s* 'raven'; Greek ποινή 'requital, punishment, reward', ἐδ-ανό-ν 'food'; Latin *plē-nu-s* 'full', *som-nu-s* 'sleep'; Old Irish *lā-n* 'full'; (e) Proto-Indo-European **-i-no-*, **-ī-no-*: Sanskrit *dákṣ-iṇa-ḥ* 'right, able, dexterous', *aj-ína-m* 'skin', *mal-iná-ḥ* 'spotted'; Greek φήγ-ινο-ς 'beech-like', ἄνθ-ινο-ς 'consisting of flowers'; Lithuanian *áuks-ina-s* 'golden', *med-ìni-s* 'wooden'; Latin *fìbr-īnu-s* 'of or belonging to the beaver', *capr-īna* 'goat's flesh'; (f) Proto-Indo-European **-t^h-n̥no-*, **-t^h-no-*: Latin *diū-tinu-s* 'lasting a long time', *prīs-tinu-s* 'former, previous, earlier'; Sanskrit (adv.) *pra-tná-ḥ* 'former, old', *nū́-tna-ḥ*, *nū́-tana-ḥ* ''present', *prātas-tána-ḥ* 'in the morning, early'; Lithuanian *bú-tina-s* 'being, remaining, actual'; (g) Proto-Indo-European **-ni-s*: Sanskrit *agní-ḥ* 'fire'; Latin *ignis* 'fire'; Lithuanian *ugnìs* 'fire'; Old Church Slavic *ognь* 'fire'. The specialized use of **-no-* as a participle ending is discussed below.

E. Uralic: Collinder (1960:262 and 1965:108) reconstructs a Proto-Uralic **n*, which "seems to have been a stem determinative in C[ommon] U[ralic]": cf. Votyak / Udmurt *viznan* (= *vizan*) 'fishhook'; Mordvin diminutive suffixes *-ńe*, *-ńɛ* in, for example, *kine* diminutive of *ki* 'path, track'; Zyrian / Komi (diminutive) *lunan* (= *lun*) 'day'; Hungarian *vadon* 'wilderness' (*vad* 'wild', [earlier] 'forest'); Yurak Samoyed / Nenets *jehõõna* 'sturgeon'; Tavgi Samoyed / Nganasan *bakunu* 'back'; Yenisei Samoyed / Enets *behana* 'back';

Kamassian *bagyn* ‘back’; etc. According to Décsy (1990:62—63), the suffix *-*na*/*-*nä* formed denominal nouns, deverbal nouns, and deverbal verbs in Proto-Uralic, while the compound suffix *-*nya*/*-*nyä* formed denominal nouns, and the compound suffix *-*nta*/*-*ntä* formed denominal nouns, deverbal nouns, and deverbal verbs.

F. Altaic: According to Décsy (1998:62), the suffix *-an*/*-än* is used as a “denominal substantive builder expressing familiarity and emotion/affection in relationship” in Old Turkish. He also (1998:65) lists the Old Turkish suffix *-yn*/*-in*/*-ün* used as a “deverbal substantive (also adjective) builder, rare.” A suffix *-*n* is found in numerous verbal nouns throughout Altaic: cf. Written Mongolian *siŋgen* ‘liquid, fluid’ (from *siŋge-* ‘to be absorbed’); Turkish *bütün* ‘whole, entire, complete’ (from *büt-* ‘to end, to be completed’), *akın* ‘current’ (from *ak-* ‘to flow’); etc. (cf. Poppe 1955:262). In Mongolian, the primary suffix *-*n* occurs only as an ending of the *converbum modale*, as in: Mongolian *uŋsin* ‘reading’; Middle Mongolian *üǯen* ‘seeing’; Monguor *dāran dāran* ‘freezing’ (it is always reduplicated); Dagur *ul sonsoŋ* ‘not listening’; Ordos *meden* ‘knowing, knowingly’; Buriat *ūŋ* ‘drinking’, *χaraŋ ɯgī* (< negative **ügeɟi*) ‘not looking’; etc. (cf. Poppe 1955:263).

16.43. Nominalizer *-*l*- (not in Greenberg 2000; but Greenberg does list the following: §45. Gerundive-Participle L; Illič-Svityč 1971—1984.II:20—21, no. 253, *-*lʌ* adjectival suffix; see also Hegedűs 1992b:35—37 *-*lʌ*: suffix of adjectives; Bomhard—Kerns 1994:169); see below: gerundive-participle *-*la*.

A. Afrasian: Ehret (1995:18) reconstructs two **l* suffixes for Proto-Afrasian: (a) **l* attributive and complement deverbative suffix and (b) adjective suffix. He notes that “[a] noun-deriving suffix turns up widely in Afroasiatic with a variety of effects. In pre-proto-Semitic (pPS) it can be proposed to have been a noun-patient and noun-complement formative (Ehret 1989: Table 13a). Examples of the suffix in Egyptian seem often to go with attributive nouns or noun complements, while a similar function may [have] existed in Chadic … and in Cushitic. In Cushitic, *l became especially prominent as a suffix in animal names, probably because such names not infrequently derive from roots descriptive of the animals’ attributes, i.e., their appearance or behavior. Like *y and *n, *l became important as an adjective-forming suffix…”

In his study of the origin of third consonants in Semitic roots, Ehret (1989:134) notes: “The consonant **l* can also occur in C_3 position in verbs of two other kinds, durative and essive/inchoative. The durative cases can co-occur with nouns having the same three consonants and a complementive meaning, thus appearing to be verb derivatives of original nouns. The essive/inchoative verbs in **l* can plausibly be explained as derivatives in parallel fashion from earlier adjectives, although coexistent adjectives are harder to find; thus the case that can be made for this proposition is weak if one

relies on Semitic evidence alone. But in Cushitic both noun and adjective suffixes in **l* can be reconstructed, and the essive/inchoative examples of **l* as C_3 have provisionally been attributed here to pre-P[roto]-S[emitic] adjectives, widely converted to verbs in Semitic." Arabic examples cited by Ehret include: *ʔaml* 'to hope, to hope for' ~ *ʔamal* 'hope'; *maṣl* 'to drip' (presumed derivation from a no longer existent noun 'drip, drop'); *ṭufūl* 'to decline toward setting' ~ *ṭafal* 'time between afternoon and sunset, twilight'; *maʿl* 'to hasten, to urge to haste' ~ *maʿil* 'quick, fast, swift'; *maṭl* 'to prolong, to stretch, to lengthen, to delay, to defer' (presumed derivation from a no longer existent adjective 'long, lengthy'); *haml* 'to be bathed in tears, to shed tears in profusion, to flow, to rain steadily and uniformly' (presumed derivation from a no longer existent adjective 'drenching, flowing steadily' or from a noun 'flow, outflow'); etc.

B. Dravidian: Krishnamurti (2003:199) reconstructs a Proto-Dravidian deverbal suffix **-al*: cf. Proto-Dravidian **keṭ-al* 'evil' > Tamil *keṭal* 'evil' (cf. *keṭu* 'to perish, to be destroyed, to decay, to rot, to become damaged, to degenerate; to destroy, to damage, to spoil, to defeat'); Proto-Dravidian **kūṭ-al* 'joining (intr.)', **kūṭṭ-al* 'uniting (tr.)' > Tamil *kūṭal* 'joining, sexual union', *kūṭṭal* 'uniting' (cf. *kūṭu* 'to come together, to join, to meet'); Kannaḍa *kūḍal* 'state of being joined with or endowed with, junction'; Telugu *kūḍali* 'joining, meeting, junction'; Proto-Dravidian **enk-al* 'left-over food' > Tamil *eñcal* 'defect, blemish, extinction' (cf. *eñcu* 'to remain, to be left behind, to survive, to lack, to be deficient, to be spoiled, to be marred, to transgress'); Malayalam *eccil*, *iccil* 'remains and refuse of victuals'; Kannaḍa *eñjal* 'left-over food'; Telugu *engili* 'left-over food'; Koḍagu *ecci* (with loss of *-l*) 'scraps of food that fall on the floor during a meal'; Tamil, Malayalam, Kota *añc-al* 'fear'; etc.

C. Kartvelian: In Kartvelian studies, the Arabic term "masdar" is used to indicate the verbal noun in preference to "infinitive" (cf. Hewitt 1995:423). There are a number of masdar forms involving *l* that belong here (see below, under gerundive-participle **-la*, for details; see also Hegedűs 1992b:35). Note also Fähnrich—Sardshweladse (1995:122) Proto-Kartvelian **-el* derivational affix > Georgian *-el* (as in *sax-el-i* 'name', *q'v-el-i* 'cheese', *grʒ-el-i* 'long', *tx-el-i* 'thin'); Mingrelian *-al*, *-a*, *-e*, *-u* (as in *ʔv-al-i* 'cheese'); Laz *-al*, *-a*, *-e*, *-u* (as in *q'v-al-i* 'cheese'); Svan *-el*, *-e*, *-o* (as in *dətx-el* 'thin'); etc.

D. Indo-European: The suffix **-lo-* was used to create denominal and deverbal adjectives in Proto-Indo-European: cf. Sanskrit *bahu-lá-ḥ* 'thick, dense, wide, abundant'; Latin *simi-li-s* 'like, resembling, similar'; Greek μεγά-λο-ς 'big, great', χθαμα-λό-ς 'near the ground, on the ground, flat', ὁμα-λό-ς 'even, level; equal', πῑ́α-λο-ς 'fat, plump'. This suffix was also used to create nominal stems: cf. Latin *legulus* 'a picker' (*legō* 'to collect, to gather together, to pick'), *nebula* 'vapor, fog, mist', *vinculum* 'a band, cord, chain' (*vinciō* 'to bind, to tie round'); Greek νεφέλη 'a cloud' (νέφος 'a cloud'). Finally, it was used to form diminutives: cf. Latin *mensula* 'a little table' (*mensa* 'table'). For details, cf. Burrow 1973:148; Brugmann 1904:327—328, 333, 334, 335, and 338; Hegedűs 1992b:35; Lindsay 1894:331—334.

E. Uralic: Collinder (1960:259 and 1965:106—107) reconstructs a Proto-Uralic suffix **l* used (a) to create substantives from substantives, (b) adjectives from substantives, and (c) adjectives from adjectives: cf. Finnish *käpälä* 'paw' (cf. Estonian *käpp* 'paw'), *vetelä* 'fluid, liquid, loose' (*vesi*/*vete-* 'water'); Lapp / Saami *njoammel* 'hare'; Mordvin *numolo* 'hare'; Votyak / Udmurt *lunal* 'day' (cf. Zyrian / Komi *lun* 'day'), *jumal* 'sweet, unleavened'; Zyrian / Komi *jumol* 'sweet, sweetish', *gõrdol* 'reddish' (*gõrd* 'red'); Hungarian *hangyál* 'ant'; Tavgi Samoyed / Nganasan *ŋamtalaa* 'horned' (*ŋamta* 'horn'); Selkup Samoyed *mogal* 'vertebra' (*mog* 'back, spine'); Kamassian *kaadel* 'face' (cf. Yurak Samoyed / Nenets *sææʔ* 'face'); etc. Décsy (1990:61—62) sets up a Proto-Uralic suffix **-la*/**-lä*, which was used to form: (a) denominal nouns, (b) deverbal nouns, (c) denominal verbs, and (d) deverbal verbs. Hegedűs (1992b:37) cites the following examples from Yukaghir: *tadil* 'giving' (*tadik* 'give!'), *wuel* 'doing' (*wiek* 'do!').

F. Altaic: As noted by Hegedűs (1992b:35—36), "this morpheme is also attested in the Tungus branch as **-la* forming deverbal nouns and adjectives. It was retained in all Tungus languages either in the original form or in a slightly modified form, cf.: Evenki *olgorilān* 'jealous' (*olgori-* 'to be jealous'), Even *ikēlen* 'singer' (*ikē-* 'to sing'), Evenki *soktomola* ~ *soktomula* 'drunken' (*soktomu-* 'to get drunk'), Solon (no longer productive) *urīlẽ* 'family; courtyard' (*urīn-* 'to stop [of nomads]'), Negidal *gojalan* 'apt to butt' (*goja-* 'to butt'), Olca [Olch] *vāčila* 'barking dog' (*vači-* 'to bark'), Orok *jājala* 'singer' (*jaja-* 'to sing'), Nanaj *herkele* 'strap' (*herke-* 'to fasten'), etc." Greenberg (2000:189) briefly mentions that *-l* forms nouns and adjectives from verbs in Orkhon Turkish. Décsy (1998:62—64) also lists Old Turkish (a) *-l* denominal adjective builder, (b) *-la*/*-lä* rare adjective builder, mainly in words which stand in predicate, (c) *-al*/*-äl*/*-yl* deverbal substantive builder, (d) *-laγ*/*-läg* denominal substantive builder, (e) *-lyγ*/*-lig* denominal substantive (nomina possessoris) builder, (f) *-lyq*/*-lik*/*-luk*/*-lük* denominal substantive (concrete and abstract) builder, and (g) *-lyγ*/*-lig* adjective builder, provided with something (nomina possessoris). Note here Azerbaijani *-lI*, which is used to derive adjectives from nominal stems, as in *atlï* 'provided with a horse, horseman' (*at* 'horse'). In Azerbaijani, there is a multifunctional suffix *-lIK*, which is used to form abstracts (cf. *yaχšïlïġ* 'goodness' [*yaχšï* 'good']), professions (cf. *müellimlik* 'profession of a teacher' [*müellim* 'teacher']), and nouns of location and instrument (cf. *kömürlük* 'coal cellar' [*kömür* 'coal'], *gozlük* 'glasses' [*göz* 'eye']). There is also a homophonous suffix *-lIK* in Azerbaijani, which is used to form adjectives meaning 'good for…, concerning…' (cf. *aylig* 'for a month' [*ay* 'month'], *bizlik* 'concerning us' [*biz* 'we']). West Kipchak has the denominal suffix *-lXK*, *-lUK* (cf. *arqunluq* 'slowness, gentleness', *aruwliχ* 'purity', *bazlïq*, *bazïlïχ*, *bazluχ* 'peace', *oγurluχ* 'theft'). In Turkmenian, the multifunctional suffix *-lIK* is used to create abstract nouns (cf. *doθtluq* 'friendship' [*doθt* 'friend']), place nouns (cf. *dašlïq* 'stony place' [*daš* 'stone']), and collective nouns of numerals (cf. *bœšlik* 'unit of five'). There is also a homophonous suffix *-lIK*, which is used to form adjectives meaning

'intended or suitable for' (cf. *donluq mata* 'material for clothing'). One of the most frequent adjective suffixes is *-li* (cf. *θowatlï* 'with document' [*θowat* 'document']). Note the Tatar suffixes *-lĔ* (cf. *aqĭlĭq* 'clever', *kŏčlŏ* [= *kŏslŏ*] 'strong') and *-lĔK* (cf. *süzlĕk* [= *hüδlĕk*] 'dictionary', *yĕgĕtlĕk* 'bravery', *küplĕk* 'multitude'). In Kazakh, the suffix *-lIK* is used to form nouns and adjectives from noun stems (cf. *qalalïq baq* 'municipal park'), while *-LI* forms adjectives from nouns (cf. *muŋdï* 'sad' [*muŋ* 'sadness']). The suffix *-LAs* (which corresponds to *-DAš* in several other Turkic languages) is used to denote fellowship (cf. *žerles* 'countryman' [*žer* 'land']). Hegedűs (1992b:37) also briefly mentions the Turkic suffixes *-ly*, *-lyk* and notes that Menovshchikov compared them with Eskimo *-lyk*. She assumes that both the Turkic and Eskimo suffixes ultimately go back to a common Nostratic source.

G. Eskimo: Hegedűs (1992b:37) compares Eskimo *-lyk*, suffix forming nomina possessoris with attributive-predicative and substantive features. She cites the following examples: (a) Greenlandic Eskimo: *tungalik* 'having juice' (*tungo* 'juice'), *sakulik* 'armed' (*sako* 'weapon'); (b) Alaskan Eskimo: *qayalik* 'having a kayak' (*qayaq* 'kayak'), *awiyatalik* 'place with a lot of shrubs' (*awiyak* 'shrubbery'), *moqtalik* 'place rich in water' (*moq* 'water').

16.44. Nominalizer *-k^h- (not in Greenberg 2000; Illič-Svityč 1971—1984.I:312—313, no. 189, *-*ķä* nominal diminutive suffix; Bomhard—Kerns 1994:169)

The Dravidian and Uralic examples cited here are phonologically ambiguous. They may belong under Nominalizer *-*k'a* instead (see below).

A. Dravidian: Krishnamurti (2003:200) reconstructs the following compound Proto-South Dravidian noun formatives: (a) *-*(i)kay*- (cf. Kannaḍa *bē-ge* 'fire' [*bēy* 'to burn'], *paṇṇ-ige* 'decoration' [*paṇṇu* 'to make'], *toḍ-ige* 'ornament to wear' [*tuḍu* 'to wear' < **toḍu*]) and (b) *-*(i)kk-ay* (cf. Kannaḍa *alas-ike* 'weariness' [*alasu* 'to be weary'], *ir-ke* 'an abode' [*ir-* 'to be'], *agal-ke* 'separation' [*agal* 'to be separated']; Telugu *kōr-(i)ke* 'a wish' [*kōru* 'to wish'], *pūn-(i)ke*, *pūn-(i)ki* 'perseverance' [*pūnu* 'to undertake'], *man-iki* 'living' [*manu* 'to live']).

B. Indo-European: Nominal/adjectival-forming suffixes in *-k^h- are also found in Indo-European. For details, cf. Brugmann 1904:326—327 (*-*qo*-), 327 (*-*is-qo*-), 338 (diminutive *-*qo*-), 340 (*-*qo*-); Lindsay 1894:336—338; Palmer 1980:256. Burrow (1973:197) notes: "[i]t is often simply an extension which adds nothing to the meaning, but also it has in some cases a diminutive sense…" Examples include: Greek (adv.) πρόκα 'forthwith, straightway, suddenly'; Latin *reciprocus* 'returning, going backwards and forward', *senex* 'old, aged; an old person', *bellicus* 'warlike' (*bellum* 'war'); Old Church Slavic *prokъ* '(adj.) remaining; (n.) remainder'; Sanskrit *udaká-m* 'water' (*udán-* 'water'), *sanaká-ḥ* 'old' (*sána-ḥ* 'old'); Gothic *mannisks* 'human' (*manna* 'person, man'); Old High German *altisc* 'old' (*alt* 'old'); etc. In a diminutive

function, cf. Greek μεῖραξ ‘a young girl, a lass’; Sanskrit *maryaká-ḥ* ‘a little man’ (*márya-ḥ* ‘young man’).

C. Uralic: Collinder (1960:257 and 1965:105—106) reconstructs a Common Uralic denominative suffix **k*. He notes that “[i]t is impossible to tell what function this formant had in C[ommon] U[ralic]. To some extent it may be identical with deverbative **k* …” Examples include: Vote *pihlaga* ‘mountain ash’; Lapp / Saami *pætnaka-* ‘dog’ (*pæna* ‘dog’), *ætnak* (predicative) ‘much’ (attributive *ætna* ‘much’); Cheremis / Mari *južga* ‘cold and penetrating’ (*už* ‘cold wind’); Yurak Samoyed / Nenets *pirće* ‘high’; etc. Collinder (1960:258—259 and 1965:106) also reconstructs **kk*, which “sometimes has a diminutive function”: cf. Lapp / Saami *suonahk* ‘lash-rope in a sledge’ ([formerly] ‘made of sinews’ [*suotna* ‘sinew’]); Mordvin *avaka* ‘the female’ (*ava* ‘mother, woman’); Cheremis / Mari *laksak* ‘pit’, *laksaka* ‘valley’, *laksikä* ‘small valley’ (*laksõ* ‘pit’); Votyak / Udmurt, Zyrian / Komi *nylka* ‘girl, lass’ (*nyl* ‘girl, daughter’); Vogul / Mansi *morah* ‘cloudberry’; Ostyak / Xanty *mănńək* = *mănńə* ‘younger stepbrother’; Yurak Samoyed / Nenets *jæhaku*, diminutive of *jæha* ‘river’; Tavgi Samoyed / Nganasan *ńomuku*, diminutive of *ńomu* ‘hare’; Finnish *punakka* ‘red, red-faced’ (*puna* ‘red color’); etc. Décsy (1990:61) reconstructs a Proto-Uralic suffix **-ka*/**-kä*, which was used to form: (a) denominal nouns, (b) deverbal nouns, and (c) denominal verbs. See also Raun 1988b:566: “[t]hus the refle[xes] of an alleged Proto-Uralic **-kkV* suffix designate not only a result or [an instrument] of an action, but also an actor, cf. H[ungarian] *maradék* ‘remainder’, F[innish] *menekki* ‘demand, sale’, E[stonian] *söök* ‘food’, S[amoyed] Y[urak] *śīǰek* ‘liar’.”

D. Altaic: Décsy (1998:62—64) lists Old Turkish (a) *-ki*/*-qy* denominal adjective builder, belonging to someone (occasionally makes substantives), (b) *-qa*/*-kä* rare denominal substantive and adverb builder, identical with dative ending, (c) *-qan*/*-kän* denominal substantive (title) builder, (d) *-ki* (occasionally also *-qy*) adjective builder, often after locative case ending, (e) *-q*/*-uq*/*-üq* deverbal substantive/adjective builder, and (f) *-q*/*-k*/*-uq*/*-ük* deverbal adjective builder. West Kipchak has the denominal suffix *-AK* (cf. *kesek* ‘price’, *qïsraq* ‘mare’). There is also a deverbal suffix *-(V)K* (cf. *satuχ* ‘trading, selling’, *artuq*, *artuχ* ‘more’, *yazoq*, *yazuq*, *yazuχ yazuq*, *yezuq* ‘sin’, *areχ*, *arïχ* ‘thin’, *tešik* ‘hole’). There is a suffix *-ki* in Azerbaijani, which is used to derive relational adjectives (cf. *aχšamki* ‘pertaining to the evening’ [*aχšam* ‘evening’]), adjectives from locatives (cf. *baγdaki* ‘located in the garden’ [*baγda* ‘garden’]), and nouns from genitives (cf. *bizimki* ‘ours’ [*bizim* ‘our’]). Like possessive suffixes and demonstrative pronouns, *-ki* takes on the ‘pronominal *n*’ in oblique cases (cf. *bizimki-n-den* ‘from ours’). In Turkmenian, the suffix *-ki* is used to derive relational adjectives (cf. *aġšamki* ‘pertaining to the evening’ [*aġšam* ‘evening’]) and adjectives from genitives and locatives (cf. *Amanïŋkï* ‘belonging to Aman’). In Tatar and Bashkir, the suffix *-AK* is used to derive noun stems from noun stems (cf. Tatar *bašaq* ‘ear of corn’; Bashkir *kiθek* ‘piece’). Similarly, *-Kay* (cf. Tatar *balaqay* ‘dear little baby’, *esekey* ‘mummy’).

E. Gilyak / Nivkh: Note the (Amur, East Sakhalin) nominalizing suffix *-k* indicating object/person (cf. *hyjm-* 'to grow old' > *hyjmk* 'old man') (cf. Gruzdeva 1998:22).

16.45. Nominalizer **-k'-* (not in Greenberg 2000; Illič-Svityč 1971—1984.I: 312—313, no. 189, **-ḳä* nominal diminutive suffix)

The Dravidian and Uralic examples cited above under Nominalizer **-k^{h}a* are phonologically ambiguous. They may belong here instead.

A. Kartvelian: Proto-Kartvelian diminutive affix **-ik'-* > Georgian *-ik'-* diminutive affix (cf. Old Georgian *vac-ik'-* 'small goat'); Mingrelian *-ik'-*; Laz *-ik'a-* (cf. *xoǯ-ik'a-* 'a steer, bull-calf'), complex diminutive affix *-ik'ina-* (cf. *xoǯ-ik'ina-* 'bull-calf'). Cf. Klimov 1998:80.
B. Indo-European: Nominal/adjectival-forming suffixes in **-k'-* (traditional **-ĝ-* [**-ĝ-*, **-ǵ-*] and **-g-*) are also found in Indo-European: cf. the following examples from Sanskrit: *dhṛsáj-* 'bold', *sanáj-* 'old', *bhiṣáj-* 'physician', *sraj-* 'garland', *tṛṣṇáj-* 'thirsty', *ásvapnaj-* 'not sleeping', *uśij-* 'a kind of priest', *vaṇíj-* 'merchant', *bhuríj-* 'shears', *sphíj-* 'hip'; *śṛ́ṅ-ga-* 'horn', *váṁsa-ga-* 'bull', *pata-ga-*, *pataṅ-ga-* 'bird', etc. Cf. Burrow 1973:198 — Burrow does not cite corresponding non-Indo-Iranian examples, however, Schwyzer (1953.I:498) lists several Greek examples of nominal stems containing -γ- and -γγ- suffixes (cf. πάταγος 'a clatter, a crash [of trees falling]; a chattering [of teeth]', ἁρπαγή 'seizure, rapine, robbery, rape; the thing seized, booty, prey', etc.), and Lindsay (1894:355) lists a number of Latin examples. The diminutive function is absent in Indo-European.

V. VERBS: NON-FINITE FORMS

There is a good deal of overlap between the forms discussed here and those discussed above as nominalizers. The non-finite verb forms are to be considered a subset of the above forms.

16.46. Participle **-n-* (Greenberg: §42. Participle N; Dolgopolsky 2008, no. 1526a, **n̄V* a marker [pronoun] that formed analytic equivalents of passive participles [(in descendant languages) → derived passive verbs])

A. Elamite: As noted by McAlpin (1981:79—80): "Verbals in Middle Elamite consist of two participles, one in *-n* and one in *-k*... The participle in *-n* is 'active,' which seems to be nonpast and progressive." Note also Grillot-Susini (1987:34): "The participle in *-n* represents a passive or an intransitive of unaccomplished-durative aspect (present-future tense, durative)..." Cf. also Khačikjan 1998:41—42; Reiner 1969:83. Examples include: *talu-n-* 'writing',

hali-n- ‘toiling’, *turu-nu-n* ‘saying’. The infinitive marker *-*Vn* reconstructed by Krishnamurti (2003:348) for Proto-Dravidian may belong here as well.

B. Kartvelian: Proto-Kartvelian **na-* word-formation affix of the past participle > Georgian *na-* (cf. Old Georgian *na-p’arev-* ‘stolen’, *na-t’ex-* ‘broken, broken off’, *na-šob-* ‘born’, etc.); Mingrelian *no-*; Laz [*no-*]; Svan *na-* (cf. *na-k’id-* ‘taken’, *na-səm-* ‘heard’, etc.) (cf. Klimov 1998:136; Fähnrich 1994:240 and 2007:311—312; Fähnrich—Sardshweladse 1995:259). As noted by Klimov, “[t]he Svan affix is highly productive to this day…”

C. Indo-European: The suffix **-no-* was one of the means Proto-Indo-European used to indicate past passive participles. Its use in this function has been abandoned in most of the daughter languages, though traces survive here and there (cf. Sihler 1995:628; Lindsay 1894:324). In Sanskrit, however, it remained fully productive (cf. *bhug-ná-ḥ* ‘bent’, *gīr-ṇá-ḥ* ‘swallowed’, *kīr-ṇá-ḥ* ‘scattered’, *pūr-ṇá-ḥ* ‘filled’, etc.). Cf. Burrow 1973:370; Buck 1933:322—324; Fortson 2004:98 and 2010:109; Sihler 1995:628; Szemerényi 1996:323. According to Meillet (1964:277), however, strictly speaking, these stems were adjectives in Proto-Indo-European and not participles.

D. Uralic: Greenberg (2000:178) mentions the Finno-Ugric suffix *-n* used to derive nouns and adjectives from verbs, while Raun (1988b:566) notes that “[t]he suffix **-nV* appears both in infinitives and participles. Thus ‘to go’ is Z[yrian] *munnị*, V[otyak] *mịnnị*, H[ungarian] *menni*, and the participle ‘going’ is V[ogul] *minne*, S[amoyed] Y[urak] *ḿinda*.”

E. Altaic: Poppe (1955:262) notes that the suffix **n* is found in numerous verbal nouns in Written Mongolian. He compares it with the Korean perfect participle *-n*, and the Turkic suffix *-n* found, for example, in Turkish *bütün* ‘whole, entire, complete’ (from *büt-* ‘to end, to be completed’). In Classical Mongolian, the suffix *-(u)n/-(ü)n* forms the gerund of absolute subordination (cf. Grønbech—Krueger 1993:23—24): cf. *abun* ‘grasping’ (*ab-* ‘to take, to grasp, to get hold of’), *iden* ‘eating’ (*id-* ‘to eat, to consume’). In Chuvash, the past (post-terminal) participles end in *-nĂ*, which, as noted by Greenberg (2000:178), belongs with the forms under discussion here (cf. also Clark 1998:446). Finally, Greenberg (2000:178) notes: “Another productive use is in the Tungus present tense in the first- and second-person singular of some languages where, however, it has an active meaning, for example, Evenki *wā-n-ni* < **wā-n-si* ‘thou killest’. A use closer to that of Indo-European, Korean and Ainu is Evenki *-na* ~ *-ne* ~ *-no*, which, when suffixed to a verb stem, indicates the result of an act, as in, for example, *dukū-na-w* ‘what I have written’ (‘thing-written-my’; Menges 1968b: 82).” The use of the suffix **-(V)n-* to form verbal nouns in Turkic is discussed by Menges (1968b:137): “The verbal noun in *-n*, *-Vn*, though rare, should be mentioned here. It occurs in A[ncient] T[urkic], and, as it seems, oftener in Ujγur [Uighur], but it is later found as a relic only; cf. U[ighur] *ti-jin* ‘saying’, *ij-in* ‘following’, also *jaq-yn* ‘approaching’ in *jaq-yn käl-* ‘to come near’. It is the ancient nomen praesentis in *-n*/*-Vn*, living on in Mongol and Turkic in the function of a plain gerund, but in Tungus it is still found as the ancient ‘present-base’, not only in the Manǯu

[Manchu] nomen praesentis in *-m-bi* < **-n* + *bi* (cf. BANG, 'Études ouralo-altaïques'), but also in the older group of forms of the heteroclitic aorist in the North Tungus languages…"

F. Etruscan: The Etruscan present participles ending in *-an* (such as, for example, *turan* 'giving', *mulvan* 'founding', etc.) belong here as well. Cf. Bonfante—Bonfante 1983:85.

16.47. Participle **-t^h-* (Greenberg: §43. Passive Participle T; Dolgopolsky 2008, no. 2313, **ṭV* a marker of passive participial constructions)

A. Dravidian: South Dravidian past/perfective participle marker **-tu*/**-ttu* (cf. Krishnamurti 2003:330—331).

B. Indo-European: Proto-Indo-European participle ending **-t^ho-* > Sanskrit *-ta-ḥ* (cf. *śru-tá-ḥ* 'heard', *ga-tá-ḥ* 'gone', *pati-tá-ḥ* 'fallen', *jñā-tá-ḥ* 'understood', *diṣ-ṭá-ḥ* 'pointed out', etc.); Greek -το-ς (cf. κλυ-τό-ς 'heard of, famous, renowned', βα-τό-ς 'gone', τα-τό-ς 'stretched', γνω-τό-ς 'understood', δρα-τό-ς 'flayed', etc.); Latin *-tu-s* (cf. *strātus* 'spread out', *(g)nā-tu-s* 'born', *(g)nō-tu-s* 'known', *sū-tu-s* 'sewn', *ten-tu-s* 'stretched', *dic-tu-s* 'said', etc.); Old Church Slavic *-tъ* (cf. *ši-tъ* 'sewn', etc.); Lithuanian *-ta-s* (cf. *siū́tas* 'sewn', etc.) (cf. Fortson 2010:109; Szemerényi 1996:323; Beekes 1995:250—251; Brugmann 1904:317—318 **-to-*; Buck 1933:307—308; Burrow 1973:370—371;Watkins 1998:64; Sihler 1995:621—625; Lindsay 1894:335—336; Palmer 1980:256—257). Again, Meillet (1964:277) considers such stems to have been adjectives.

C. Uralic: According to Collinder (1960:271 and 1965:115), **t* was used to form infinitives and participles in Fennic, Lappish, Ob-Ugric, and Samoyed: cf. Finnish (lative) *juota* (dial. *juotak*) 'to run'; Lapp / Saami (Lule) (infinitive) *mannat* 'to go'; Ostyak / Xanty infinitive ending *-taŭə* (this may be identical with the ending *-ta[k]* ~ *-tä[k]* of the Finnish [lative case of the] infinitive), present participle active, as in *jăntti* 'playing' (*jănt-* 'to play'), (Northern) present participle passive, as in *and ośti* 'unknown'; Yenisei Samoyed / Enets (Baiha) *jebide* 'drunk' (*jebi-* 'to be drunk'). Cf. also Greenberg 2000:180.

D. Etruscan: In Etruscan, we find active past participles ending in *-θas*, as in *avil svalθas LXXXII* 'having lived eighty-two years' (cf. Bonfante—Bonfante 2002:102—103).

16.48. Participle **-nt^h-* (Greenberg: §44. Participle NT; Bomhard—Kerns 1994: 170)

This ending is found in several Eurasiatic languages. It is an obvious combination of the two preceding suffixes: **-n-*+**-t^h-*.

A. Indo-European: The participle ending **-nt^h* is found in all of the older Indo-European daughter languages: cf. Sanskrit *bhárant-* 'bearing', *bhávant-*

'being'; Greek φέροντ- 'bearing'; Latin *ferent-* 'bearing', *amant-* 'loving'; Gothic *frijōnds* 'friend' (< 'loving'), *bairands* 'carrying, bearing'; etc. (cf. Szemerényi 1996:317—319; Brugmann 1904:315 *-*ent*-, *-*nt*-, *-*n̥t*-; Burrow 1973:367—368; Beekes 1995:249—250; Sihler 1995:613—616; Lindsay 1894:352; Palmer 1980:312—313; Fortson 2010:108; Meier-Brügger 2003: 185). In Hittite, there is a single participle ending: *-ant-*. As noted by Sturtevant (1951:78, §111), "[i]f the verb from which a participle is formed is intransitive, it is usually convenient to translate it by an active English participle (e.g. *a-ša-an-za* 'being': *e-eš-zi* 'he is', pl. *a-ša-an-zi*), while a participle from a transitive verb generally calls for a passive expression in English (e.g. *a-da-an-za* 'eaten': *e-iz-za-az-zi* 'he eats', pl. *a-da-an-zi* 'they eat'). Although participles are formed from the stems with suffix or other modification which in I[ndo-] E[uropean] grammar are called tense stems, the Hittite participles do not denote time. If a verb has both active and middle conjugation, it is not possible to assign its participle to either voice."

According to Greenberg (2000:183—184), the Proto-Indo-European third person plural ending *-*nt*^{h}*i* of the present tense is to be derived from the participle *-*nt*^{h}. This idea is not new — Oswald Szemerényi and Thomas Burrow proposed a similar theory. In my 1988 article on "The Prehistoric Development of the Athematic Verbal Endings in Proto-Indo-European" (1988c:475—488), I accepted the views of Szemerényi and Burrow. However, I have since proposed a different explanation (1996a:76). Basically, I see the incorporation of the third person ending *-*t*^{h} into the conjugational system in Proto-Indo-European as an innovation (so also Watkins 1998:59: "The third persons in *-t-*, *-nt-* belong to a later chronological layer"), which, nevertheless, must have taken place at an early date since it is found in Anatolian as well as later stage daughter languages. I believe that the third plural was indicated by the ending *-*n* at the time that *-*t*^{h} was added and that, with the addition of the *-*t*^{h}, a new third plural ending was created, namely, *-*nt*^{h}. At a later date, this was further extended by a deictic *-*i* meaning 'here and now' to form so-called "primary" endings. Thus, while the new third plural ending *-*nt*^{h} was identical in form with the participles ending in *-*nt*^{h}, I believe that, ultimately, they had a different origin (a similar conclusion is reached by Sihler 1995:615, note a). Note that there may be evidence from the Indo-European daughter languages for an unextended third plural ending *-n*: cf., for example, the so-called "secondary" third plural forms in Sanskrit *ábharan*, Avestan *barən*, and Greek ἔφερον. These are usually interpreted as being derived from *-*nt*^{h} through loss of the final *-*t*^{h}. But, could they not be simply relics of an earlier unextended *-*n* instead? Quite honestly, it is probably impossible to tell whether or not this suggestion has any validity given that regular phonological developments in each of these daughter languages can also account for loss of final *-*t*^{h} rather nicely.

B. Uralic: Proto-Uralic *-*nt*- (cf. Collinder 1960:269—270 and 1965:113—114; Greenberg 2000:184). In Finnish, this is a deverbative suffix, while in Lapp / Saami, it forms absolute gerunds. Examples include: Finnish *ammunta*

'shooting, fire' (*ampu-* 'to shoot'), *ammunta* '(the act of) lowing, mooing' (*ammu-* 'to moo, to low'), *myynti* 'sale' (*myy-* 'to sell'); Lapp / Saami *kuotteht*, *kuotteda-* '(the reindeer's) calving-time' (*kuodde-* 'to calve'), absolute gerund *lokadettin*, (Tornio) *lokadin* 'while (he is, was) reading' (*lohka-* 'to read'; cf. Finnish *luenta* 'the act of reading', *luento* 'lecture'); Zyrian / Komi *jitõd* 'joining, fastening; tie, band, etc.' (*jit-* 'to tie or sew together'); Selkup Samoyed present participle in *-nde*, as in *ilinde* 'living'; Taigi participle in *-nde*, as in *ilinde* 'living'.

C. Gilyak / Nivkh: Greenberg (2000:184) notes: "In Gilyak there is a verb suffix that in the standard dialect of the Amur region takes the form *-d′* and in Northeastern Sakhalin, *-nd*. Grube (1892:30) notes that in the collection of Gilyak data of Glehn and Schrenk it includes as variants *-nt*, *-nč*, and *-č*. The first is characteristic of the Tym dialect of Sakhalin, whereas the latter are found on the west coast of the same island." Kortlandt (2004:288) as well identifies the Gilyak / Nivkh verbal suffix (Amur) *-d′*/*-t′*, (East Sakhalin) *-d*/*-nd*/*-nt* (cf. Gruzdeva 1998:22) with the participial suffix **-nt-* found in Indo-European and Uralic.

16.49. Gerundive-participle **-l-* (Greenberg: §45. Gerundive-Participle L)

A. Dravidian: Caldwell (1913:543) describes a group of verbal nouns ending in *-al* (or *-dal*) in Tamil. Unfortunately, he does not give an in-depth explanation of the uses of this ending. He does mention, however, that "[i]t is remarkable that *l* or *al* is used also in Mongolian as a formative of verbal nouns..." McAlpin (1981:52) also mentions this ending: "It is possible that the ending **-al* on the verb stem could be Proto-Dravidian in origin; see Andronov, 1979, p. 69." And that is all he says! In his descriptive grammar of Tamil, R. E. Asher (1982:20, §1.1.2.2.1) gives a little more information:

> The most usual marker of a noun clause is a nominalized verb form. In the formal variety of the language, these nominalized forms fall into two types: (i) nominalized forms marked for tense. The most common — one found for all verbs — is one consisting of verb stem + *(t)tal*, e.g. *varutal* 'the coming', *koṭuttal* 'the giving'...

Clearly, the ending *-(t)tal* described by Asher has been built by adding *-al* to *-(t)t-*.

Krishnamurti (2003:346) reconstructs a South Dravidian **-al* infinitive-nominal marker > Kota *-l*, *-lk*; Old Kannaḍa *-al* (+ *ke*); Tuḷu *-alka*/*-akka*; Kuwi *-ali* ~ *-eli*. The infinitive-nominal marker **-al* should be included with the forms being discussed here.

B. Kartvelian: In a long section on Georgian participles, Vogt (1971:246—254) devotes considerable attention to perfect passive participles (he uses the term [p. 247] "participes passés passifs") in *-ul-*/*-il-* (see also Fähnrich 1993:67—69,

and, for Old Georgian, Fähnrich 1994:77): *c'er-il-i* 'written', *k'r-ul-i* 'tied, bound', etc. Note also the noun *c'er-ili* 'letter' (that is, 'that which has been written'). Klimov (1998:81) reconstructs a Common Georgian-Zan **-il* affix used to form participles (see also Fähnrich—Sardshweladse 1995:178 and Fähnrich 2007:213—214). Tuite (1997:37) notes that, in Svan, "[t]he masdar (*li-*) is used in … roughly the same contexts as in Georgian, and can take nominal as well as verbal stems…" Svan also has a past participle in *lə- (-e)* (cf. Tuite 1997:37). Finally, Svan has "two distinct future participles, denoting patients and themes (*le-*), and instruments and destinations (*la- -a*)" (cf. Tuite 1997:37).

C. Indo-European: Godel (1975:128) points out that **-lo-* endings form participles or infinitives in Tocharian, Slavic, and Armenian: "Both the INFINITIVE and PARTICIPLE belong to the *o* declension (3.2): in *bereal* as well as *berel*, *-l* < **-lo-*. Evidence for primary adjectives in **-lo-* is found in several I[ndo-] E[uropean] languages: G[reek] *deilós* 'cowardly', *tuphlós* 'blind'; Lat[in] *pendulus* 'hanging', etc. In O[ld] C[hurch] S[lavic] this morpheme supplies the active past participle, mostly used in compound tenses (*bilŭ jesmĭ* 'I have struck'). Verbal adjectives in *-l* < **-lo-* also occur in Tokharian (Eastern dialect; instead of *-l*, Western Tokharian has *-lye*, *-lle* < **-lyo-*). Thus, we have a frame of reference for the Armenian participle in *-eal*. As, on the other hand, adjectives do not evolve into infinitives, the above evidence does not account for *berel*. Although there are only faint traces of P[roto-]I[ndo-]E[uropean] action nouns in **-lo-*, such a formation has to be postulated in order to explain the Armenian infinitive: it may have been productive in some limited dialectal area." The Tocharian, Slavic, and Armenian developments are discussed at length by Greenberg (2000:186—188). In Old Church Slavic, the resultative participle was formed by adding the suffix *-l-* to the infinitive stem. The resultative participle indicated the result of a completed action. It was used in compound verbal categories (perfect, conditional), where it was accompanied by a finite form of the verb 'to be': cf. *jesmь neslъ* 'I have carried', *bimь*/*byxъ neslъ* 'I would carry'.

D. Uralic: According to Greenberg (2000:188—189), **-lV* is used to form participles in Samoyed. He notes: "In Kamassian the aorist, which is used to indicate both past and present tense, is formed by a participle in *-la*, *-le*, or *-l*, for example, *nere-le-m* 'I fear' ('fear-*le*-I'). This participle occurs also in Selkup (e.g. *ity-lä* 'taking'), where it is used as a verbal participle just like Russian *berja* (Serebrennikov 1964: 89)." Greenberg also notes that *-l* is used to form infinities in Yukaghir: "The *l*-morpheme we have been discussing is prominent in Yukaghir. What is sometimes described as the infinitive is formed by an *-l* suffix, e.g. Kolyma *kelu-l* 'arrival, to arrive' (Krejnovich 1979b: 355). It may also qualify a noun, e.g. *lodo-l adilek* 'a playing youth'. The verbal noun in *-l* also forms an optative, e.g. *ā-l-uol* 'wish to do' (Kolyma dialect, literally, 'do-*l*-wish'). In addition, if it is intransitive it may be predicated, in what is called the definite conjugation, that is, when the verb is unfocused and the statement supplies definite information about the subject (if the verb is

intransitive), i.e. is an answer to such questions as 'who played?' An appropriate answer is *met-ek lodo-l*, which might be paraphrased as 'I-am-the-one-who-played' (for *-ek*, see No. 23). The *-l* participle is also found in the extinct Omok dialect of Yukaghir (Tailleur 1959a: 94)."

E. Altaic: Greenberg (2000:189) briefly mentions that *-l* forms nouns and adjectives from verbs in Orkhon Turkish: "In Orkhon Turkish *-l* forms nouns and adjectives from verbs, e.g. *ine-l* 'trustworthy' (a name) (cf. *ine-* 'to trust'), *qıs-ı-l* 'mountain-cliff, canyon' (cf. *qıs* 'make narrow'). The first of these is strikingly similar to Latin examples such as *crēdulus* cited earlier." Greenberg further remarks: "In Mongolian, *-l* forms nouns of action 'not taken in any particular way' (Groenbech and Kruger 1955: 41), e.g. *ab-ul* 'a taking', *ay-ul* 'fright'. After a consonant stem the suffix is *-ul* ~ *-ül*; after a vowel, *-l*."

VI. VERBS: FINITE FORMS

16.50. Imperative **k^hV* (Greenberg: §47. Imperative KA; Dolgopolsky 1984:89 **KV* (**kV* or **gV*) 'thee, thy' and 2008, no. 839, **kV* ~ **gV* 'thee, thy'). According to Dolgopolsky (1984:89), "[o]riginally, this pronoun functioned as a verbal object…and as a postnominal possessive…"

The vowel is difficult to pin down — the evidence from the daughter languages points to proto-forms **k^ha*, **k^hi*, and **k^hu*. This leads me to suspect that we may ultimately be dealing here with the deictic stems **k^ha* (~ **$k^hə$*), **k^hi* (~ **k^he*), and **k^hu* (~ **k^ho*) (see above) used adverbially. Used in conjunction with a verb, their original function was to reinforce the imperative: GO+**k^ha* = 'go here (close by)!', GO+**k^hi* 'go over there (not too far away)!', GO+**k^hu* 'go yonder (far away)!'. When so used, **k^ha*, **k^hi*, and **k^hu* were interpreted as imperative markers in Uralic, Altaic, and, in relic forms, in Indo-European. In Afrasian, however, **k^ha*, **k^hi*, and **k^hu* were interpreted as second person markers: GO+**k^ha* = 'you go (here)!', GO+**k^hi* 'you go (over there)!', GO+**k^hu* 'you go (yonder)!'.

A. Afrasian: A second person personal pronoun stem **kV-* is widespread in Afrasian (cf. Diakonoff 1988:74—75, table of Suffixed Object Pronouns, and 76—77, table of Suffixed Possessive Pronouns; Lipiński 1997:308, §36.19; Ehret 1995:194, 195, and 198: **ki* 'you' [f. sg. bound pron.]; **ku*, **ka* 'you' [m. sg. bound pron.]; **kuuna* 'you' [pl. bound pron.] [= **ku* + old Afrasian pl. in **-n*]). In Semitic, this stem appears as the second person singular and plural personal pronoun suffix (table taken from Moscati 1964:106, §13.14; see also Lipiński 1997:308 and 362—363; Gray 1934:64 Proto-Semitic affixed personal pronouns: 2nd sg. m. **-k-ă̆*, 2nd sg. f. **-k-ĭ̆*; O'Leary 1923:153—155; R. Stempel 1999:80—81; Barth 1913:43—48; Bergsträsser 1983:8; Gragg—Hoberman 2012:191, table 4.23):

	Akkadian	Ugaritic	Hebrew	Syriac	Arabic	Geez
m. sg.	*-ka*	*-k*	*-k*	*-k*	*-ka*	*-ka*
f. sg.	*-ki*	*-k*	*-k*	*-k*	*-ki*	*-ki*
m. pl.	*-kunu*	*-km*	*-kem*	*-kōn*	*-kum(u)*	*-kəmmū*
f. pl.	*-kina*	*-kn*	*-ken*	*-kēn*	*-kunna*	*-kən*
dual		*-km*			*-kumā*	

In Akkadian, this stem is also found in the genitive/accusative and dative second person singular and plural independent pronouns: (m. sg. gen.-acc.) *kāti/a*, (f. sg. gen.-acc.) *kāti*, (m. pl. gen.-acc.) *kunūti*, (f. pl. gen.-acc.) [*kināti*]; (m. sg. dat.) *kāšim*, (f. sg. dat.) *kāši(m)*, (m. pl. dative) *kunūši(m)*, (f. pl. dat.) [*kināši(m)*]. In Egyptian, the second person singular masculine suffix pronoun is *k* 'thou, thy, thee', while it appears as *k-* [**ⲕ-**] and *-k* [**-ⲕ**] in Coptic. Also, the following are found in East Cushitic: Proto-East Cushitic (m.) **ku*, (f.) **ki* second person singular personal pronoun (object) 'thee' > Saho *ku*; Afar *ko-o*; Burji *šee*; Somali *ku*; Rendille *ki*; Boni *ku*; Dasenech *kuu-ni* 'thou', *ko* 'thee'; Galla / Oromo *si*; Konso *ke*; Gidole *he(de)*; Sidamo *hee*; Hadiyya *ke(e)s*; Dullay *ho-* ~ *he-*. In Southern Cushitic, the following forms occur: Proto-Southern Cushitic **ki* second person singular feminine personal pronoun 'your' > Iraqw *ki*, *kiŋ* 'you' (f. sg.), *-k* in *-ok* 'your'; Burunge *igi* 'you' (f. sg.), *-g* in *-og* 'your'; Alagwa *ki* 'you' (f. sg.), *-k* in *-ok* 'your'; Dahalo *ki* 'your' (cf. Ehret 1980:243). Proto-Southern Cushitic **ku* second person singular masculine personal pronoun 'your' > Iraqw *ku*, *kuŋ* 'you' (m. sg.), *ku-* in *kunga* 'you' (pl.), *-k* in *-ok* 'your'; Burunge *ugu* 'you' (m. sg.), *-g* in *-og* 'your'; Alagwa *ku* 'you' (m. sg.), *ku-* in *kungura* 'you' (pl.), *-k* in *-ok* 'your'; K'wadza *-ku* 'your'; Asa *-ku* 'your'; Dahalo *-ku* 'your' (cf. Ehret 1980:245—246). Diakonoff (1988:75) lists the following Chadic second person object pronouns (suffixed in Musgu and Logone, but not in Hausa and Mubi): (a) singular: Hausa (m.) *ka*, (f.) *ki* 'you, your'; Musgu *-ku(nu)*; Logone *-kú*, *-ku*, *-kəm*; Mubi *ka*, *ki*; (b) plural: Hausa *ku* 'you, your'; Musgu *-ki(ni)*; Logone *-kún*; Mubi *kan*. Note also Ngizim: *ka(a)* 'you', second person singular (m. or f.) used as subject pronoun in verbal and locative sentences (cf. Schuh 1981:89); *kə̀m* 'you', second person feminine singular pronoun used as: (1) independent pronoun, (2) indirect object pronoun, (3) associative pronoun, and (4) independent associative pronoun (cf. Schuh 1981:87); *kùn* 'you', second person plural pronoun used as: (1) independent pronoun, (2) indirect object pronoun, (3) bound suffix pronoun, and (4) independent associative pronoun (cf. Schuh 1981:98); *cì* 'you', second person singular masculine pronoun used as: (1) independent pronoun, (2) indirect object pronoun, (3) bound suffix pronoun, and (4) independent associative pronoun (cf. Schuh 1981:31).

B. Indo-European: Greenberg (2000:193) cites evidence from Balto-Slavic for an imperative ending **-kV*: Baltic imperative suffix *-k* ~ *-ki* (cf. Lithuanian *dúo-k*,

dúo-ki ‘give!’); Slavic modal particle *-ka* (*-ko*, *-ku*, *-ki*, *-kъ*, *-če*, *-či*, *-ču*) (cf. Russian *-ka*, *-ko*, “which are sometimes put after the imperative to make a request more pressing”, Serbo-Croatian *-ka*, and Ukrainian *-ko*). In Russian and South Slavic, these particles may also occur after pronouns. Cf. Stang 1966:427 (proto-form **-ǵe*); Walde 1927—1932.I:326. Greenberg’s comments regarding the Hittite middle imperative form *-ḫut(i)* are not convincing.

C. Uralic-Yukaghir: Proto-Finno-Ugrian imperative **-k*, **-ka*/**-kä* (cf. Collinder 1960:303—304, §§963—974; Décsy 1990:75; Abondolo 1998a:28; Raun 1988b:562—563). Collinder (1965:131—132) remarks: “**k* apparently had two functions in the C[ommon]U[ralic] verb paradigm, occurring as a tense characteristic in the present tense, and as a mood characteristic in the imperative. The latter function is no doubt secondary, but it is so widespread that it must date from CU. Probably the imperative characteristic was **-k* (or **-kõ* ~ **-ke*) in the 2sg, and **-ka* ~ **-kä* in the other persons. In Finnish **-k* is preserved in some eastern dialects, elsewhere it has disappeared *in pausa* or changed into a faint glottal stop, as in *anna’*, Savo *annak* ‘give!’ (stem: *anta*-). In Lappish, **-k* has disappeared or changed into an unvoiced vowel, but the weak grade of the stem shows that the second syllable was once closed, as in *poađě* ‘come!’ (stem: *poahte*-). In Mordvin, the **-k* is preserved, as in *eŕak* ‘live!’. In Northern Samoyed and Kamassian, **-k* has changed into a glottal stop. It is worth noting that in Tavgi the 2nd sg imper has, contrary to expectation, the strong grade. For example, [Yurak] *mada’*, [Tavgi] *matu’*, [Yenisei] *mota’* ‘cut!’. In Selkup the 2nd imper ends in *-k* (Castrén) or *-äśik* (Prokof’ev). In the Ket dialect the stem is, as was to be expected, in the weak grade.” Proto-Yukaghir imperative affix **-k* (> Northern / Tundra *-k*) (cf. Nikolaeva 2006:81).

D. Altaic: Greenberg (2000:194) lists several non-Chuvash Turkic languages with imperatives ending in *-k*: Old Turkic *-ok*; Noghay *-ok*; Shor *-ok*; Karakalpak *-ak*; Tatar and Bashkir *-uk*. For Tungus, Greenberg (2000:194) notes that Benzing reconstructed a Proto-Tungus imperative built from a suffix **-ki* (or **-gi*). Greenberg further notes (2000:195) that the second person singular imperative is *-ka* in Nanay / Gold. As noted by Gorelova (2002:299—300), the optative suffix *-ki* is used in Manchu as an imperative when addressing equals.

16.51. Conditional **ba* (Greenberg: §41. Adverbial Participle P)

It appears that the original form was **ba* and not **P*, though this creates problems with the Turkish data, which point to **pa* instead. That the Eurasiatic stem was **ba* instead of **pa* seems particularly likely, however, in view of the fact that Greenberg derives the Anatolian forms from an Indo-European particle that Pokorny (1959:113) reconstructs as **bhĕ*, **bhŏ*. Note also the consistent single writing in Hittite, which points to a voiced stop in Proto-Indo-European, according to “Sturtevant’s Law”. The evidence from Mongolian also points to original **ba*. The material from Uralic is phonologically ambiguous.

A. Dravidian: Note the causative suffix reconstructed for Proto-Dravidian by McAlpin (1981:46): "Similarly, there seems little trouble in reconstructing a causative P[roto]-Dr[avidian] *-*pi* (*vi*, *ppi*) as a true causative. Although less commonly attested, it does occur widely in Dravidian languages". Likewise, Krishnamurti (2003:283—285) reconstructs a Proto-Dravidian causative suffix *-*pi-* (allomorphs *-*pi-* ~ *-*wi-* ~ *-*ppi-*): "The causative -*pi-* [-wi-] ~ -*ppi-* is attested in the Tamil-Brahmi inscriptions of the second century BCE, e.g. *koṭupitōn* (= /koṭu-ppi-tt-ō<u>n</u>/) 'he caused something to be given', *a<u>r</u>upita* (= /a<u>r</u>u-ppi-tta/) rel. ppl. 'that caused to be cut' (Mahadevan 1971:90—1). This causative is also found in South Dravidian II and in Brahui." A little later on, Krishnamurti notes: "Comparison of the Telugu causative stems with Old Tamil inflectional stems permits reconstruction of Proto-Dravidian causative stems as follows":

Proto-Dravidian *_key-_ 'to do': Tamil *cey*, Telugu *cēyu*
Proto-Dravidian *_naṭ-a-_ 'to walk': Tamil *naṭa*, Telugu *naḍa*

	Old Tamil	Old Telugu	Proto-Dravidian
Past:	*cey-vi-tt-*	*cēy-i-nc-*	**key-pi-ntt-*
	naṭa-ppi-tt-	*naḍa-pi-nc-*	**naṭa-ppi-ntt-*
Non-past:	*cey-vi-pp-*	*cēy-i-mp-*	**key-pi-mpp-*
	naṭa-ppi-pp-	*naḍa-pi-mp-*	**naṭa-ppi-mpp-*

B. Kartvelian: According to Fähnrich (1993:139—140), in Georgian, intransitive verbs form the causative through the addition of the character vowel *a-* and the suffix -*eb*: *v-a-muša-v-eb* 'I let work' (*v-muša-ob* 'I work'). In transitive verbs, on the other hand, the causative is formed by means of the character vowel *a-* and the suffix chains -*in-eb* or -*ev-in-eb*, the latter occurring only in verbs with present stem formants -*i*, -*am*, and -*av* and without a root vowel. (The situation is actually a bit more complicated — for details on causative formations in Georgian, cf. Hewitt 1995:215—216 and 407—422; Vogt 1971:127—133; Fähnrich 1993:139—140.) In Modern Georgian, -*eb* is not only the most common verbal thematic suffix, it also has multiple functions. First, it is one of several thematic suffixes (-*av*, -*am*, -*eb*, -*ob*, -*i*) used to mark present(/future) verb forms. Comparable forms are found in Mingrelian (-*ap* [< *-*ab* < *-*eb*]) and Laz (-*ap* [< *-*ab* < *-*eb*]) (but not in Svan) (cf. Klimov 1964:78 *-*eb* and 1998:45 *-*eb*; Fähnrich—Sardshweladse 1995:119 *-*eb*; Schmidt 1962:106; Fähnrich 1994:240 and 2007:144—145). Next, it is used, as indicated above, as a causative present stem formant. In this use, it may be related to the forms under discussion here.

C. Indo-European: The Indo-European forms Greenberg cites from Gothic (*ba* conditional particle: 'if, even though') and Old Church Slavic (*bo* 'for') correspond very well with the Mongolian conjunction *ba* 'and, also'. (On

Gothic *ba*, cf. Lehmann 1986:55; see also Krause 1968:210. On the same page, Lehmann lists a Gothic adverbial suffix *-ba* and illustrates its use with an example, namely, *baitraba* 'bitterly'. He remarks: "Isolated, both in G[ermanic] and the I[ndo-]E[uropean] languages; origin obscure".) Similarly, in Mongolian, "There are modal adverbs with the meaning 'completely', derived by reduplication of the first syllable of the word with the inserted consonant *-b*. If the first syllable of the word concerned is *no*, the adverb is *nob*; if the first syllable is *qa*, the adverb is *qab*, and so on" (quote from Poppe 1974:59—60, §218). The parallel between Gothic and Mongolian is striking.

D. Uralic: The Proto-Finno-Ugrian present participle suffix **-pa*/**-pä* probably belongs here as well: cf. Finnish present participle ending *-pa* ~ *-pä* (preserved after a few monosyllable stems, elsewhere: *-va* ~ *-vä*) (cf. *käy-vä* 'walking', present participle of *käy-* 'to go, to walk'; *käy-pä raha* 'legal tender'; *elä-vä* 'living, alive, lively', present participle of *elä-* 'to live'; *syö-vä* 'eating', present participle of *syö-* 'to eat'; *syö-pä* 'cancer'; *kumarta-va* [Agricola *kumarta-pa*] 'bowing', present participle of *kumarta-* 'to bow'); Veps *el'äb* 'living'; Livonian *jelaa'b* 'living'; in Lapp / Saami, this suffix is found in the 1st plural, 2nd plural, 2nd dual, and 3rd dual of the present indicative, as in: (1st pl.) *mannap*, (2nd pl.) *mannapehtiht*, (2nd dual) *mannapæhtte*, (3rd dual) *mannapa* (*manna-* 'to go'); in Ob-Ugric and Samoyed, this suffix forms participles and *nomina actoris*, etc.: Vogul / Mansi *l'uśəp nee* 'a weeping woman' (*l'uńś-* 'to weep or cry'), *minpä* 'going' (present participle of *min-* 'to go'), *holp* 'dead' (*hool-* 'to die'), *sɛŋkäp* 'mortar' (*seŋk-* 'to beat'); Ostyak / Xanty *jyntəw*, *jyntəp* 'needle' (*jant-* 'to sew'); Yurak Samoyed / Nenets *pohoopa* 'vigorous' (*poho-* 'to be near to the end, to come near, to be near to recovering'); Yenisei Samoyed / Enets *kaabe* 'dead' (*kaa-* 'to die'); Selkup Samoyed *kuubie* 'dead' (*kuu-*) 'to die'; Kamassian *kube* 'dead' (cf. Collinder 1960:270 and 1965:114).

E. Altaic: The Classical (Written) Mongolian conditional gerund *-basu* (also *-besü* and *-ubasu*/*-ubesü* after *b* and *r*; Modern Mongolian has *-bala*/*-bele*) is used to indicate an act which is the necessary condition of the following action coming into effect (as Greenberg notes, *-basu* is made up of the past converb [i.e. adverbial participle] *-ba-* plus *a-su* 'would be'; the suffixes used to indicate past tense are *-ba*/*-be* and *-bai*/*-bei*, as in *ögbe* or *ögbei* 'he gave', *odba* or *odbai* 'he went, he departed' — for details, cf. Poppe 1974:164—165, §§588—589). Constructions using the conditional gerund are usually translated with 'when, if', as 'when this happens, then that', 'if this happens, then that', so that there is an implied temporal relationship as well as an implied cause and effect relationship (cf. Poppe 1974:95, §366): cf. *yabubasu* 'if he goes, when he went', *γarubasu* (*γar-*) 'if he goes out, when he went out', *abubasu* (*ab-*) 'if he takes, when he took', *bosbasu* 'if he rises, when he rose', *ögbesü* 'if he gives, when he gave'. Thus, this construction could easily develop into a causative, as Greenberg notes.

According to Menges (1968b:135—136), there is a syndetic gerund suffix *-p*/*-Vp* in Turkic, which is used to indicate "the expression of successive actions whose time-levels are not essentially different or distant from each

other. A further formation is that in *-pan*/*-pän*//*-ban*/*-bän*, the instrumental or an ancient allative of the preceding, found in the Inscriptions and in the older layer of [Uighur] with *n* < *ň*, but otherwise rare in [Uighur].” Menges (1968b:136) also notes, in particular: “In Mongol, this suffix is found implicit only in combination with other suffixes, while in Tungus it has an exact equivalent in South Tungus [Manchu] and [Jurchen] *-fi* and [Nanay] and [Udihe] *-pi* where also the ancient [Proto-Altaic] final vowel has been preserved, while in North-Tungus it exists, as in Mongolian, only in combination with other suffixes. As to Uralic, RÄSÄNEN (“Mat. Morph.”, 191) compares it correctly, as it seems, with the Finno-Ugric suffix *-pa*/*-pä* of the Pariticipium praesentis.” Regarding Turkic *-p*/*-Vp*, Greenberg (2000:175) notes: “In Turkic its syntax and meaning are much like the Russian adverbial participle (*dejeprichastije*) in *-ja*, e.g. ‘weeping, he came.’ Since Turkic languages do not mark adjectives for number, gender, person, or case, there are no participles in the proper sense. Moreover, as with the Russian adverbial participle, the subjects of the subordinate and main verbal form are the same. With such a form as the probable starting point a number of developments, syntactic and semantic, can take place. The adverbial participle can become an ordinary participle (‘weeping he came’ becomes ‘he the weeping one came’). Moreover, simultaneous or nearly simultaneous action easily takes on a causal or conditional nuance.”

It is worth noting that Starostin—Dybo—Mudrak (2003:226) reconstruct a Proto-Altaic passive/causative formant *-*b*-.

On the basis of what has been discussed above, I think we are justified in setting up a Proto-Nostratic particle **ba* meaning ‘then, therefore’, just as Greenberg suggests. This particle was inherited by Eurasiatic. Originally, **ba* could be used with verbs to indicate a conditional relationship, but without necessarily any reference to time, that is to say that the actions could be either simultaneous or successive, thus: ‘when this happens, then that happens (at the same time)’, ‘when this happens, then that comes about (at a later time)’. This is basically the situation found in Turkic. The next stage is found in Mongolian, where there is an implied temporal relationship as well as an implied cause and effect relationship. The implied cause and effect relationship develops into causatives in Dravidian and Kartvelian.

16.52. Hortatory-precative *-*li* (Greenberg: §48. Hortatory L)

A. Afrasian: A precative *l*-prefix occurs in Semitic (cf. Moscati 1964:144: “*l*-, which occurs in Talmūdic Aramaic *lehĕwē* ‘he is’, may be considered a remnant of precative *l*”). Lipiński (1997:356) notes: “Widespread is the use of the proclitic *lu*-/*li*-/*la*-, especially with the third person, to express the optative or precative… Prefixing of the proclitic *l*- to a verb occasionally entails graphic deletion of imperfect *y*-; e.g. Sabaic [Sabaean] *lhṣlḥnn* < *l*+*yhṣlḥnn* ‘may they grant prosperity’.”

B. Elamite: In Old Elamite, there is a precative-hortatory marker *-li* (cf. McAlpin 1981:80—81, §242.443). Grillot-Susini (1987:40), however, considers *-li* to be "an ancient or dialectal form [used to] mark the optative". Achaemenid Elamite uses *-ni* in the same function. Cf. also Khačikjan (1998:34, 38, and 50) for more information on the Elamite precative/optative particles *-ni*, *-LI* (Old Elamite), *-na*.
C. Indo-European: Here, we may compare Hittite imperative first person singular *-allu* (after consonants), *-llu* (after vowels): *pí-iš-ki-el-lu* 'I will give', *me-ma-al-lu* 'I will speak', *i-ya-al-lu* 'I will make', etc. (cf. Sturtevant 1951:141—142; Greenberg 2000:196).
D. Altaic: Menges (1968b:139) notes that the suffix of the imperative (hortatory) first person plural in Turkic has the basic form *-ały*, to which either *-m* (of the first person singular) or *-q* (of the first person plural) or *-n*, *-ŋ* may be attached. Menges cites the following forms from Uighur as examples of *-(a)łym*: *ötün-älim* 'let us venerate!', *biti-lim* 'let us write!'. Décsy (1998:73) reconstructs the Proto-Turkic imperative first person plural endings as **-alym*/**-älim*. Greenberg (2000:196) compares this form with those under discussion here.
E. Eskimo: Greenberg (2000:197) notes that "[a]ll dialects of Eskimo use a verb suffix *-li* to express an optative or imperative of the first and third person". Fortescue (1984:291—292) notes that West Greenlandic has the optative markers *-li* (3rd person) and *-la* (1st person). Greenberg (2000:197) discusses the patterning in several other Eskimo dialects.

16.53. Causative **-sV* (Greenberg: §50. Causative S; Nafiqoff 2003:107)

A. Afrasian: There are various causative prefixes in Semitic, the most common of which is *š-*, which is found in Akkadian, Ugaritic, and South Arabian (except Sabaean): cf. Akkadian *ušamqit* 'he caused to fall', from *maqātu* 'to fall down, to collapse; to fall, to fall to the ground'. A similar formation, with prefix *s-*, is found in Egyptian: *s-sḏm* 'to cause to hear', from *sḏm* 'to hear', *s-nfr* 'to make beautiful', *s-ḫr* 'to cause to fall', etc. The same goes for Berber: cf. Tamazight *ssərwəl* 'to cause to flee, to rout', from *rwəl* 'to run, to flee'. In several Afrasian languages (such as East Cushitic and Hausa, for example), causatives are formed with a suffix *-s*: cf. Burji *gat-is-* 'to cause to sell', from *gat-* 'to sell', etc. Causatives in *-s* (or extended forms) are also found in Omotic: cf. the Aari causative suffix *-sis-* in *wur-sis-* 'to cause to hear', from *wur-* 'to hear', or the Dime causative suffix *-s-* in *wuy-s-u* 'cause to stand!, stop!', from *wuy* 'stand!'. For Proto-Southern Cushitic, Ehret (1980:63) reconstructs causative **-Vs-* > Iraqw, Burunge, Alagwa *-Vs-*; K'wadza, Asa *-Vs-*; Ma'a *-V*, *-s* in complexes of the form *-sV*, and *-ti* (< **Vtis*, which historically was a sequence of a continuative and a causative); Dahalo *-Vð-*, *-VVð-*, *-VðVð-*. The **s* causative in Afrasian is discussed by Ehret (1995:34): "The causative in **s* continues to be productive in many of the languages of the Afroasiatic family

today, although in the Boreafrasian [Semitic, Berber, and Egyptian] division of the family it long ago became a prefixed rather than a suffixed marker."

B. Indo-European: As noted by Greenberg (2000:200—201), remnants of a causative *-s* can be deduced from a number of formations in Indo-European (the common causative suffix has been reconstructed as **-eyo-* [cf. Szemerényi 1996:274—279; Beekes 1995:229; Burrow 1973:331 and 357—357]). Perhaps the strongest evidence comes from Tocharian, which is the only branch to have a **-se/o-* verb formative identical in meaning to **-sk^{h}e/o-* (cf. Adams 1988:76 and 102, fn. 48) — elsewhere, **-s-* is used as a present-tense suffix, as a desiderative marker, and to form future forms (cf. Beekes 1995:231). We may venture a guess here that the original meaning of the **-se/o-* formative in Tocharian was causative as distinct from the **-sk^{h}e/o-* formative, which was durative or iterative-intensive, meanings well attested for this suffix in other Indo-European daughter languages (cf. Beekes 1995:230; Fortson 2004:90 and 2010:99; Szemerényi 1996:273). With the phonological merger of these two formants in Tocharian, the causative meaning mostly prevailed.

C. Uralic-Yukaghir: According to Greenberg (2000:201), there is a causative *-se-* in the Tundra dialect of Yukaghir (cf. *tire-se-* 'to drown [tr.]' versus *tire-* 'to drown [intr.]'). This appears as *-š-* in the Kolyma dialect (cf. *modo-š-* 'to cause to sit' versus *modo-* 'to sit'). Cf. Maslova 2003b:213—215; Nikolaeva 2006: 83 (Proto-Yukaghir causative affix, transitive **-sə-*).

D. Altaic: Menges (1968b:161) discusses a rare Turkic denominative suffix *-sy-/ -si-* used to form the simultative aspect. He notes that the specifically simultative meaning of this suffix has been lost in the modern Turkic languages. Menges compares the Turkic suffix with the Mongolian formation in *-mi-ši-ja*. Greenberg (2000:201) further mentions South Tungus formations in *-si*. None of the Altaic formations discussed by Greenberg have a specifically causative meaning. Starostin—Dybo—Mudrak (2003:226) reconstruct a desiderative/inchoative formant **-s-* for Proto-Altaic.

E. Eskimo: Greenberg (2000:202) notes: "In Eskimo the *s* causative is found in Sirenik *-səχ-*. In Siberian Yupik the causative marker *-sta* of Chaplino is analyzed by Emeljanova (1982: 157) as consisting of *-s-* causative and *-ta* transitivizer. The so-called 'half-transitive' in *-si-* found in West Greenlandic and other Eskimo dialects (the term is Kleinschmidt's, in modern terminology it is called 'antipassive') may belong here. When added to an instrumental base it allows it to take an object in the instrumental case. In Aleut, *-sa-* derives transitive from intransitive verbs, for example, in the Siberian Aleut of Bering Island, we find contrasts such as *ukaγa-kuχ* 'he gives' vs. *ukaγa-sa-kuχ* 'he brings'."

16.54. Inchoative **-na* (not in Greenberg 2000)

The original meaning of this extension appears to have been inchoative (also called "inceptive" or "ingressive"): 'starts to…', 'becomes such'. This sense is preserved

in Afrasian and Uralic. In Dravidian, it first acquired an inceptive-continuative connotation, from which it developed a future-habitual meaning: ‘starts to and continues…’ This is reminiscent of the situation in Korean, where, according to Ultan (1978:108), the derivational suffix indicating inchoative may also occur in the sense of future existence. In Indo-European, on the other hand, it acquired an inceptive-completive connotation: ‘starts to and finishes…’ An inchoative *-*n*- is posited for Proto-Nostratic by John C. Kerns in our joint monograph (cf. Bomhard—Kerns 1994:170).

A. Afrasian: Ehret (1995:31) reconstructs a Proto-Afrasian verb extension **n*, which “can have the connotation either of unboundedness of an action (hence “non-finitive”) or of inceptivity of the action involved. The extension in **n* has an inceptive effect especially commonly, and that may thus have been its original meaning.” Ehret further notes that **n* “was once very productive in the Agaw branch of Cushitic.” Finally, Ehret claims that “[i]n Semitic the verbal prefix **n*-, conveying a passive or reflexive meaning, would seem a probable reflex of PAA *n.” According to Diakonoff (1988:106): “Stirpes of the N-/M-type have reflexive (and reciprocal) semantics; later they evolve in direction of Passive. In Old Egyptian *n*- is attested almost exclusively as a means of lengthening biconsonantal roots (thus sometimes also in Semitic). In Berber and Cushitic the stirpes of the M-type are commonly used instead of stirpes of the N-type, i.e. as reflexive and reciprocal stirpes (in the Semitic languages the marker *mV*- is widely used only in the formation of verbal nouns, but not finite verbal forms).”

Regarding stems in Semitic with prefix *n*-, Moscati (1964:126—127, §16.15) notes: “This stem has passive and reflexive meaning. It is attested over the entire Semitic area (with some traces in Egyptian) with the exception of Aramaic. In Ethiopic it is rare but occurs in some quadriradical verbs. Examples: Akk[adian] *naprusu* ‘to be separated’, root *prs*; Heb[rew] *niš’al* ‘he was asked’, root *š’l*; Ar[abic] *’inqaṭa‘a* ‘he was cut to pieces’, root *qṭ‘*. In Akkadian this theme adopts in part the vowel distribution of the simple stem (cf. §16.2 and von Soden GAG, p. 118); with stative verbs its meaning is predominantly ingressive: e.g. *ibašši* ‘he is’, *ibbašši* ‘he becomes’; *našā’um* ‘to carry’, *nanšūm* ‘to shoulder’. In Ugaritic this stem is attested but the *n* is almost invariably assimilated to the following consonant (cf. however *nkbd* ‘honored’, root *kbd*). In Ethiopic — as has been mentioned — this stem appears with some quadriconsonantal verbs, e.g. *’anfar'aṣa* ‘he jumped’; from the semantic point of view, however, Ethiopic shows a development towards a causative connotation which is, perhaps, connected with the formal identity of the prefixes (Brockelmann, GVG, I, p. 536).” According to Lipiński (1997:393—395), *n*-stems denote reflexive, reciprocal, and passive meaning. He points out that similar formations (usually with *m*- in place of *n*-) also exist in Libyco-Berber, where they give a reflexive or reciprocal meaning, as well as in Cushitic. Lipiński suggests that “reciprocity may indeed have been the original semantic value of the N-stem”.

B. Dravidian: As noted by Krishnamurti (2003:307), "Koṇḍa has *-n-* as non-past (future-habitual) marker in finite and non-finite verbs, *ki-n-an* 'he does/will do', *ki-n-i* adj 'the one doing'." He also cites Pengo, Kui, and Kuwi evidence for use of *-n-* as a non-past (future-habitual) marker in South Dravidian: "Pengo future is marked by *-n-* and it corresponds in every aspect to Koṇḍa *-n-*, e.g. *huṛ-* 'to see': *huṛ-n-*, *in-* 'to say': *in-Ø-*; non-past adjective *huṛ-n-i*. In Kui *-d-* and *-n-* occur as future markers in complementary distribution… Kuvi [Kuwi] also has parallel distribution of *-d-* and *-n-* as future markers…"
C. Kartvelian: Svan has two distinct future paradigms: imperfective and perfective. The imperfective is based on the present stem, except that the series marker is changed to *-i*, preceded by the suffixes *-(n)-un* (Upper Bal), *-wn-*, *-ən-*, *-ōl-n-* (Lašx), *-(i)n-*. The perfective future is almost invariably preceded by one or two preverbs. Cf. Tuite 1997:29—30. The *n* element may be derived from the formative under discussion here, with a shift from inchoative to future as in South Dravidian.
D. Indo-European: Indo-European contained a nasal infix **-n-* that could be added to type II verbal stems according to the following pattern: **CC-n-éC-* (cf. Benveniste 1935:159—163 [note especially the table on p. 161]; see also Szemerényi 1996:270—271; Sihler 1995:498—499), but only when the verbal stems ended in obstruents or laryngeals (cf. Lehmann 2004:118). According to Gray (1939:137), the nasal infix denotes "the point from or to which action proceeds, so that [it] characterize[s] terminative verbs (Sanskrit *yu-ñ-ja-ti*, Latin *iu-n-g-it* 'starts to put on a yoke and carries the process through'…)." Another, less widely-accepted theory derives the nasal infix from an earlier suffix through metathesis.
E. Uralic-Yukaghir: According to Collinder (1960:279—280 and 1965:117), Proto-Uralic had a verbal **n* formant denoting 'becoming such' (cf. Finnish *parane-* 'to grow better, to recover, to improve', *vanhene-* 'to grow old, to grow older'; Lapp / Saami *buorranâ-* 'to grow better, etc.'; Cheremis / Mari *jahne-* 'to become dirty'), while Décsy (1990:63) notes that **-na*/**-nä* could be used to create momentaneous/inchoative verb stems. According to Raun (1988b:567—568), this suffix (along with several others) indicates "becoming like what is meant by the noun stem". Yukaghir: Northern / Tundra *-na:-* inchoative affix (cf. Nikolaeva 2006:82).
F. Gilyak / Nivkh: The (Amur) future marker *-ny-* (cf. Gruzdeva 1998:33) may belong here, assuming semantic development as in South Dravidian.

VII. NEGATIVE/PROHIBITIVE PARTICLES

16.55. Negative **na* (~ **nə*), **ni* (~ **ne*), **nu* (~ **no*) (Greenberg: §56. Negative N; Dolgopolsky 2008, no. 1524, **ǹi* 'not')

Negative/prohibitive **nV* occurs throughout Nostratic (cf. Bomhard—Kerns 1994: 681—682, no. 562).

A. Afrasian: Egyptian *n*, *nn*, *ny*, *nw* negative particle: ‘not’; Coptic *n-* [ⲛ-] negative particle. A negative *n* is also found in Omotic (cf. Bender 2000:219).
B. Elamite: Elamite *in-*, element of negation, *inni*, negative particle, and *ani*, prohibitive particle should be included here.
C. Kartvelian: Proto-Kartvelian **nu* ‘no, not’ (prohibitive particle) > Georgian *nu* ‘no, not’; Mingrelian *nu* ‘no, not’; Svan [*no*]. Proto-Kartvelian **numa* ‘no, not’ (prohibitive particle) > Mingrelian *numu*, *nəmə* ‘no, not’; Svan *nōma*, *nōm-* ‘no, not’. Cf. Schmidt 1962:128; Klimov 1964:148—149 and 1998:144; Fähnrich—Sardshweladse 1995:267; Fähnrich 1994:260 and 2007:323.
D. Indo-European: Proto-Indo-European negative particles **nĕ̆*, **ney-*, negative prefix **n̥-*: Sanskrit *ná*, *nā* ‘not’, negative prefix *a-*/*an-*; Old Persian *na-* ‘not’; Avestan negative prefixes *na-*, *naē-*, *a-*/*an-* ‘not’; Greek negative prefixes ἀ-/ἀν-, νη-, νε-; Latin negative prefixes *nĕ-*, *in-*, *nē* ‘not’, *nec*, *neque* (adv.) ‘not’, (conj.) ‘and not’; Oscan *nei*, *ni* ‘not’; Umbrian *nei* prohibitive: ‘not’, *neip* negative and prohibitive: ‘not’; Old Irish *ní*, *nĭ* ‘not’, *ne-ch* ‘someone, anyone, something, anything; nobody, nothing’, negative prefixes *ne-*, *nĭ̆-*, *in-*/*é-*/*an-*; Gothic *ni* ‘not’, *nei* ‘nor’, negative prefix *un-*; Old Icelandic *ne* ‘not’, (adv.) *né* ‘neither, nor’, (adv.) *nei* ‘no’; Norwegian *ni* ‘not’; Old English *ne*, *ni* ‘not’, negative prefix *un-*; Old Frisian *ne*, *ni* ‘not’; Old Saxon *ne*, *ni* ‘not’; Old High German *ne*, *ni* ‘not’; New High German *nicht* ‘not’, *nie* ‘never, at no time’; Lithuanian *nè*, *neĩ* ‘not’; Old Church Slavic *ne* ‘not’; Hittite *na-at-ta* ‘not’(cf. Pokorny 1959:756—758; Watkins 2000:57; Greenberg 2000:212).
E. Uralic: Proto-Uralic negative particle **ne* > Hungarian *në*, *nëm* ‘not’; Cheremis / Mari *nõ*, *ni*: *nõ-mat*, *ni-ma-at*, *ni-mat* ‘nothing’, *ni-gü* ‘nobody’; Votyak / Udmurt *ni*: *ni-no-kin* ‘nobody’, *ni-no-ku* ‘never’, *ni-no-mer* ‘nothing’; Ostyak / Xanty (Northern) *nem-hŏjat* ‘nobody’, *nem-huntta* ‘never’, *nemətti*, *nəməttə* ‘nothing’; Zyrian / Komi *nõm*, *nem*, *ńem* ‘nothing’; Vogul / Mansi (Northern) *nee-mäter* ‘nothing’, *neem-hot* ‘nowhere’, *neem-huuńt* ‘never’ (cf. Greenberg 2000:212; Collinder 1955:38; Rédei 1986—1988:301). (?) Yukaghir (Southern / Kolyma) *ńə-* negative pronominal marker, *ń-irkin*/*ń-irkid* ‘no one’, *ńə-qon* ‘nowhere’, *ńə-leme* ‘nothing’ (cf. Nikolaeva 2006:294).
F. Altaic: Turkic: In Chuvash, there is a preposed prohibitive particle *an* ‘no, not’ which is used to negate second and third person imperatives. Greenberg (2000:212—213) also notes that, “[i]n Tungus there is a widespread form *ana* found in Oroch, Orok, and Ulch that typically negates adjectives…”
G. Chukchi-Kamchatkan: Proto-Chukotian **nuŋ-* negative formant.
H. Eskimo-Aleut: Proto-Eskimo **na-* and **na(a)ɣɣa* ‘no’ > Alutiiq Alaskan Yupik (Koniag) *naa* ‘no! don’t!’; Naukan Siberian Yupik *naami* ‘no’; Central Siberian Yupik *na(a)*, *nalaa* ‘no’; Sirenik *naaɣɣa* ‘no’; North Alaskan Inuit *naaɣɣa*, *naakka* ‘no’; Western Canadian Inuit (Siglit) *naaka* ‘no’; Eastern Canadian Inuit (Iglulik) *naaɣɣa* ‘no’; Greenlandic Inuit *naaxxa* ‘no’. Aleut *naŋaa* ‘no’. Cf. Fortescue—Jacobson—Kaplan 1994:204.

Sumerian: Note the following: *na* ‘not’, *na-* modal prohibitive prefix (imperfect root), *nu* ‘not’, *nu-* negative prefix. Cf. Thomsen 1987:190—199.

16.56. Prohibitive particle **ma(ʔ)* (~ **mə(ʔ)*) (Greenberg: §57. Negative M; Möller 1911:158; Illič-Svityč 1971—1984.II:56—57, no. 290, **mä* prohibitive particle; Dolgopolsky 2008, no. 1353, **mä* ¬ **mäh[o]* ‘do not’ [prohibitive particle] and ‘not’ [negative])

A. Afrasian: Proto-Semitic **ma(ʔ)* negative/prohibitive particle: ‘no, not’ > Arabic *mā* ‘not’; Harari *mēʔ* ‘not’. Egyptian *m* imperative of the negative verb *i̯mi̯*: ‘do not!’ (cf. Hannig 1995:312; Faulkner 1962:100; Erman—Grapow 1921:59 and 1926—1963.2:3; Gardiner 1957:567). Proto-East Cushitic **ma(ʔ)* negative particle > Afar *ma*; Somali *maʔ* (Central Somali *mə* main sentence negative particle); Rendille *ma-* negative prefix; Dasenech *ma*. Ongota negative imperative verb prefix *ma-*, negative non-imperative verb prefix *mi-* (cf. Fleming 2002b:40). Cf. Diakonoff 1988:83, §4.4.3; Ehret 1995:301, no. 572, **ma-* ‘to not have’.
B. Kartvelian: Proto-Kartvelian **ma-* negative/prohibitive particle: ‘no, not’ > Laz *mo(t)* verbal prohibitive particle; Svan *mā-d(e)*, *mō-d(e)* particle of modal negation: ‘no, not’, *mām(a)* ‘not’, *māma* ‘no’. Cf. Klimov 1964:124—125 **mad* and 1998:113 **mad* verbal negative particle; Fähnrich—Sardshweladse 1995:227 **ma-*; Fähnrich 2007:277.
C. Indo-European: Proto-Indo-European prohibitive particle **mē* > Sanskrit *mā́* prohibitive particle: ‘not, that not’; Old Persian, Avestan *mā* prohibitive particle: ‘not’; Greek μή ‘not’; Armenian *mi* prohibitive particle: ‘do not!’; Tocharian B *mā* ‘not, no’ (simple negation and prohibition); Albanian *mos* (< **mē+kʷʰe*) prohibitive particle: ‘do not!’ (cf. Greenberg 2000:213; Pokorny 1959:703; Walde 1927—1932.II:236—237; Mallory—Adams 1997:395; Mann 1984—1987:738).
D. Altaic: Proto-Altaic **ma* negative/prohibitive particle > (a) Proto-Tungus **-me* prohibitive particle > Manchu *ume* used for negating imperatives (stands before the imperfect participle); Spoken Manchu (Sibo) *emə* ‘do not’; Jurchen *ume* prohibitive particle; Nanay / Gold *em* prohibitive particle; Oroch *em* prohibitive particle; (b) Proto-Turkic **-ma-* negative particle > Old Turkic *-ma-* negative particle; Karakhanide Turkic *-ma-* negative particle; Turkish *-ma-* negative particle; Gagauz *-ma-* negative particle; Azerbaijani *-ma-* negative particle; Turkmenian *-ma-* negative particle; Uzbek *-ma-* negative particle; Uighur *-ma-* negative particle; Karaim *-ma-* negative particle; Tatar *-ma-* negative particle; Bashkir *-ma-* negative particle; Kirghiz *-ma-* negative particle; Kazakh *-ma-* negative particle; Noghay *-ma-* negative particle; Oyrot (Mountain Altai) *-ma-* negative particle; Tuva *-ma-* negative particle; Chuvash *-ma-* negative particle; Yakut *-ma-* negative particle (cf. Menges 1968b:144; Johanson—Csató 1998). Cf. Greenberg 2000:213—214; Starostin—Dybo—Mudrak 2003:893 **ma* a negative particle. Starostin—Dybo—Mudrak remark: “A monosyllabic root, but, unlike the 1st p. pron. or the accusative particle, it did not undergo denasalization in P[roto]-A[ltaic]. This may be explained by the fact that it was in most cases already incorporated into the verbal form as a suffix. It is interesting to note Mong[olian] **büi*, **bu* ‘neg. particle’ — which may be

originally the same morpheme, but functioning as a separate word and thus subject to the rule *mV > *bV.”

16.57. Negative particle *ʔal- (~ *ʔəl-) (perhaps also *ʔel-, *ʔul-) (originally a negative verb stem, as in Dravidian: ‘to be not so-and-so’ — later used in some branches as a negative particle), probably also *li (~ *le) ‘no, not’ (Greenberg: §58. Negative E/ELE; Illič-Svityč 1971—1984.I:263—264, no. 128, *ʔäla particle of categorical negation; Dolgopolsky 2008, no. 22, *ʔäla particle of negation and categorical prohibition)

A. Afrasian: Proto-Semitic *ʔal-/*ʔul- (< *ʔəl-) element of negation > Akkadian *ūl* ‘not’; Ugaritic *ȧl* ‘not’; Hebrew *ʔal* (negative particle) ‘certainly not’, (with verb) ‘not’; Phoenician *ʔl* element of negation; Sabaean *ʔl* (negative particle) ‘not, no one’; Ḥarsūsi *ʔel* ‘not’; Śḥeri / Jibbāli *ʔɔl* ‘not’; Mehri *ʔəl* ‘not’; Arabic *lā* (negative particle) ‘not’, (with apoc. expressing negative imptv.) ‘no!’; Geez / Ethiopic *ʔal-* element of negation in *ʔalbə-*, *ʔalbo*; Tigre *ʔalä-* in *ʔalä-bu* ‘there is not’; Amharic *al-* used to express a negative verb in the perfect. Cf. D. Cohen 1970— :19, no. 3, prohibitive particle. Berber: Kabyle *ala* ‘no’.
B. Dravidian: Proto-Dravidian *al- ‘to be not so-and-so’ > Tamil *al-* ‘to be not so-and-so’; Malayalam *alla* ‘is not that, is not thus’; Kolami *ala·* ‘to be not so-and-so’; Kannaḍa *alla* ‘to be not so-and-so, to be not fit or proper’; Koḍagu *alla* ‘to be not so-and-so’; Malto *-l-* negative morpheme; Brahui *all-* base of past negative tenses of *anning* ‘to be’, *ala*, *alavā* ‘certainly not, not a bit of it’. Cf. Burrow—Emeneau 1984:22, no. 234; Krishnamurti 2003:354—356.
C. Indo-European: Hittite *li-e* element used with the present indicative to express a negative command (cf. Sturtevant 1951:139, §242; J. Friedrich 1960:139, §264a, and 145, §280; Luraghi 1997:56; Kloekhorst 2008b:523 Proto-Indo-European *leh_1 prohibitive particle). The Hittite form is isolated within Indo-European, unless, as suggested by Sommer, it is related to Old High German *lā* ‘do not!’. Many scholars take it to be from *ne*.
D. Uralic-Yukaghir: Proto-Uralic *elä* imperative of the negative auxiliary verb (cf. Collinder 1977:26). Marcantonio (2002:239) describes the patterning in Finnish as follows: “A negative verbal form is used in Finnish also in the Imperative, as shown by the pair *lue* ‘read’ vs *älä lue* ‘do=not read’ (2nd Person Singular). The negative form *älä* is often compared with the equivalent Yukaghir *el* ~ *ele*. Equivalent negative verbs and related isomorphic constructions are found in the majority of the Tungusic languages (*e-* ~ *ä-*), in Mongolian (*e-se*) (UEW 68; SSA 100) and in Dravidian.” Rédei (1986—1988:68—70) treats the negative verb *e- and the imperative *elä* together, as do many others, including Collinder and Tailleur. As noted by Greenberg (2000:214), these two forms are so closely intertwined, often through suppletion, that it is difficult to distinguish one from the other. In Yukaghir, all verbs except (Northern / Tundra) *l'e-* ‘to be, to exist’ form the negative by means of a prefix *el-* (cf. Greenberg 2000:214—215). Clearly, we are dealing

with two separate forms here. The first is the Proto-Nostratic negative particle *ʔe ‘no, not’, and the second is the negative verb ʔal- (~ *ʔəl-) ‘to be not so-and-so’. The latter is to be distinguished from the Uralic verb *elä- ‘to live, to be’ (cf. Rédei 1986—1988:73; Collinder 1955:10 and 1977:31). Greenberg’s (2000:215) analysis of the situation is as follows: “As we have just seen, the Yukaghir verb ‘to be’ is *l'e*, a form that has cognates in other Eurasiatic languages. The theory tentatively suggested to account for this and other intricate facts is that there was a Eurasiatic negative verb *e(i) that, when combined with the positive verb ‘to be’ *le*, formed a negative existential verb *e-le that in some instances lost either its initial or final vowel.” Contrary to Greenberg, the Proto-Nostratic verb under discussion here must be reconstructed as *ʔil- (~ *ʔel-) ‘to live, to be alive; to be, to exist’ (cf. Illič-Svityč 1965:341 жить[1] ‘to live’: *elʌ), not *le. To complicate matters further, there may have also been a separate Proto-Nostratic negative particle *li (~ *le) ‘no, not’ (note here the Proto-Yukaghir prohibitive affix *-lə [cf. Nikolaeva 2006:81]). The interrelationship among these forms is extremely complex.

E. Altaic: Proto-Altaic *ule (~ -i) negative particle: Proto-Mongolian *ülü- negative element preceding verbs > Written Mongolian ülü; Khalkha ül; Buriat üle; Kalmyk üle; Ordos üle, ülü; Moghol la, lü, lɛ; Dagur ul, ule; Dongxiang ulie; Shira-Yughur lə; Monguor li, lĭ. Cf. Poppe 1955:287, 288, 289, 290, and 291; Starostin—Dybo—Mudrak 2003:1493 *ule (~ -i) negative particle.

F. Chukchi-Kamchatkan: According to Greenberg (2000:216): “In the Koryak group reflexes of *ele form sentence negations or are equivalent to English ‘no!,’ a natural use for a negative existential. Examples are Palana Koryak *elle* and Kerek *ala* ‘not.’ Kerek has lost its vowel harmony system through merger so that *a* is the expected reflex of *e. Aliutor has gone through similar phonetic changes and has *al*, *alla* ‘no, not’. In addition, for prohibitives, Kerek uses the imperative of a negative auxiliary verb *illa*, which follows the negative infinitive…” Fortescue (2005:31) reconstructs Proto-Chukchi-Kamchatkan *æl(læ) ‘not’.

G. Gilyak / Nivkh: Greenberg (2000:215) compares the Gilyak / Nivkh verb stem *ali-* ‘to be unable,’ “which may be considered to represent the full form of the negative existential *ele.”

Sumerian: *li* negative particle: ‘not, un-’.

16.58. Negative particle *ʔe (Greenberg: §58. Negative E/ELE — Greenberg treats *e and *ele together; Dolgopolsky 2008, no. 3, *ʔe [~ ? *ʔä] ‘not’)

A. Uralic: Proto-Uralic *e- negative particle: ‘no, not’. For details, see the discussion above under Proto-Uralic *elä imperative of the negative auxiliary verb (cf. Collinder 1955:31 and 1977:26; Rédei 1986—1988:68—70).

B. Altaic: Proto-Altaic *e negative particle: Proto-Tungus *e- ‘not’ > Negidal *e-* ‘not’; Jurchen *ey-χe*, *esi(n)-in* ‘not’; Ulch *e-* ‘not’; Orok *e-* ‘not’; Nanay / Gold

e- ‘not’; Evenki *e-* ‘not’; Lamut / Even *e-* ‘not’; Oroch *e-* ‘not’; Udihe *e-* ‘not’; Solon *e-* ‘not’. Proto-Mongolian *e-se* ‘not’ > Written Mongolian *ese* ‘not’; Khalkha *es* ‘not’; Buriat *ehe* ‘not’; Kalmyk *es* ‘not’; Ordos *ese* ‘not’; Moghol *sa*, *se* ‘not’; Dagur *es* ‘not’; Monguor *sə*, *sī* ‘not’. Cf. Poppe 1955:287, 290, and 291 — Poppe points out that “[t]he negative *ese* is the stem of the verb *ese-* ‘not to be’ = Tungus *ẹsi-*.” Cf. Starostin—Dybo—Mudrak 2003:488 **e* ‘not’.

C. Etruscan: *ei* ‘not’.

D. Chukchi-Kamchatkan: Chukchi negative prefix *e-* ~ *a-*; Koryak negative prefix *e-* (or its expected phonetic outcomes). Cf. Greenberg 2000:216.

Sumerian: *e* ‘no’.

VIII. INTERROGATIVE, RELATIVE, AND INDEFINITE STEMS

16.59. Relative *$k^{wh}i$- (~ *$k^{wh}e$-), interrogative *$k^{wh}a$- (~ *$k^{wh}ə$-) (Greenberg: §60. Interrogative K; Nafiqoff 2003:55—58 *Ḳo, *Ḳe; Dolgopolsky 2008, no. 981, *Ḳo ‘who’; Illič-Svityč 1971—1984.I:348, no. 223, *Ḳe ‘who’, I:355—356, no. 232, *Ḳo ‘who’; Fortescue 1998:96—123 and 153—154)

A. Afrasian: This stem is not widespread in Afrasian. It is preserved in relic forms in several Semitic languages: Proto-Semitic **ka-m* ‘how much?, how many?’ > Arabic *kam* ‘how much?, how many’; Ḥarsūsi *kem* ‘how much?, how many?’; Mehri *kəm* ‘how much?’; Soqoṭri *kəm* ‘how much?’. It also occurs in Cushitic: Rendille interrogative suffix *-koh* ‘which?’; Arbore *kaakó* ‘how much?, how many?’; Galla / Oromo interrogative pronoun *kam(i)* ‘which?’. Finally, it occurs in the Kefoid branch of Omotic (cf. *kon(n)e*, *koonni*, *ko* ‘who?’) and in the Dizoid branch as well (cf. *yiki* ‘who?’) (cf. Bender 2000:209 and 226).

B. Indo-European: Proto-Indo-European *$k^{wh}e$-/*$k^{wh}o$-, *$k^{wh}i$- stem of interrogative and relative pronouns > Sanskrit *ká-ḥ* ‘who?’ (Vedic *ki-ḥ* ‘who?’), *cid* ‘even, at least’; Avestan *kō* ‘who?’; Latin *quī*, *quae*, *quod* ‘which?, what?, what kind of?’; *quis*, *quid* ‘who?, what?’; *quī* ‘how?, in what manner?’; Greek τίς, τί (indefinite) ‘anyone, anything’, (interrogative) ‘who?, which?, what?’; Old Irish *cía* ‘who?’, *cid*, *ced* ‘what?’; Gothic *hvas* ‘who?’, *hva* ‘what?, why?’; Old English *hwā̆* ‘who?’, *hwæt* ‘what?’; Lithuanian *kàs* ‘who?, what?’; Old Church Slavic *kъ-to* ‘who?’; Hittite *ku-iš*, *ku-it* (interrogative) ‘who?, what?’, (relative) ‘who, what’, (indefinite) ‘someone, anyone’, *ku-(u-)wa-at* ‘why?’ (cf. Pokorny 1959:644—648; Walde 1927—1932.I:519—523; Brugmann 1904:402; Beekes 1995:203—207; Szemerényi 1996:208—210; Watkins 1985:34 and 2000:46; Fortson 2004:130 and 2010:144—145).

C. Uralic: Proto-Uralic **ki-*, **ke-* relative pronoun stem > Finnish *ken* ~ *kene* ~ *ke-* ‘who’; Lapp / Saami *gi* ~ *gæ-* ‘who, which, what sort of’; Mordvin *ki* ‘who, somebody’; Cheremis / Mari *ke*, *kö*, *kü* ‘who’; Votyak / Udmurt *kin* ‘who’; Zyrian / Komi *kin* ‘who’; Hungarian *ki* ‘who’; Yurak Samoyed / Nenets (Southern) *kin* ‘who’ (cf. Joki 1973:268; Collinder 1955:24, 1965:138—139,

and 1977:44; Rédei 1986—1988:140—141; Décsy 1990:100). Proto-Uralic **ku-*, **ko-* interrogative pronoun stem > Finnish *kuka* ~ *ku-* 'who?', *kussa* 'where?', *koska* 'when?'; Lapp / Saami *gutti* 'who?'; Mordvin *kodamo* 'which?, what kind of a…?', *kona* 'which?', *koso* 'where?', *koda* 'how?'; Cheremis / Mari *kudõ* 'who?, which?'; Votyak / Udmurt *kudiz* 'which?', *ku* 'when?'; Zyrian / Komi *kod* 'which?', *ko* 'when?'; Vogul / Mansi *hoo*, *kon* 'who?', *hoot* 'where?', *qun* 'when?'; Ostyak / Xanty *koji* 'who?', *kŏti* 'what?'; Hungarian *hol* 'where?', *hova* 'whither?', *hogy* 'how?'; Yurak Samoyed / Nenets *hu* 'who?', *huńaŋy* 'which?'; Selkup Samoyed *kutte*, *kudö* 'who?', *kun* 'where?'; etc. (cf. Collinder 1955:26, 1965:139, and 1977:46; Rédei 1986—1988:191—192; Décsy 1990:100).

D. Altaic: Proto-Altaic **k^{h}a(y)* interrogative pronoun: 'who?, what?' > (a) Proto-Tungus **χia* (**χai*) 'who?, what?' > Manchu *ai*, *ya* 'who?, what?, which?'; Evenki *ẽ* 'who?', *ẽkūn* 'what?'; Lamut / Even *ãq* 'what?'; Negidal *ẽχun*, *ẽkun* 'who?, what?', *ẽwa* 'what?'; Ulch *χay* 'what?'; Orok *χai* 'what?'; Nanay / Gold *χaị* 'what?'; Solon *ī* 'what?'; (b) Proto-Mongolian **ken*, **ka-* 'who?, which?' > Written Mongolian *ken* 'who?, which?'; Khalkha *χen* 'who?, which?'; Buriat *χen* 'who?, which?'; Kalmyk *ken* 'who?, which?'; Ordos *ken* 'who?, which?'; Moghol *ken* 'who?, which?'; Dagur *ken*, *χen* 'who?, which?', *χā-*, *hā-* 'where?'; Monguor *ken* 'who?, which?' (cf. Poppe 1955:45 and 229); (c) Proto-Turkic **kem-*, **ka-* 'who?, which?' > Old Turkic (Old Uighur) *kem* 'who?', *qayu*, *qanu* 'which?'; Karakhanide Turkic *kem*, *kim* 'who?', *qayu* 'which?'; Turkish *kim* 'who?'; Gagauz *kim* 'who?'; Azerbaijani *kim* 'who?'; Turkmenian *kim* 'who?', *qay* 'which?'; Uzbek *kim* 'who?', *qay* 'which?'; Uighur *kim* (dialectal *kem*) 'who?', *qay* 'which?'; Karaim *kïm* 'who?'; Tatar *kem* 'who?', *qay* 'which?'; Bashkir *kem* 'who?', (dialectal) *qay* 'which?'; Kirghiz *kim* 'who?', *qay* 'which?'; Kazakh *kim* 'who?', *qay* 'which?'; Noghay *kim* 'who?'; Oyrot (Mountain Altai) *kem* 'who?', *qay* 'which?'; Tuva *qïm* 'who?', *qayï* 'which?'; Chuvash *kam* 'who?'; Yakut *kim* 'who?', *χaya* 'which?'; Dolgan *kim* 'who?', *kaya* 'which?' (cf. Menges 1968b:134—135; Róna-Tas 1998:74). Cf. Starostin—Dybo—Mudrak 2003:754 **k'a(j)* interrogative pronoun: 'who'.

E. Chukchi-Kamchatkan: Greenberg (2000:223) compares Kamchadal / Itelmen *k'e* 'who?' here. Fortescue (2005:175) derives this from Proto-Chukchi-Kamchatkan **mikæ* 'who?' (but cf. Fortescue 1998:154). Clearly, **mikæ* is a combination of **mi-* plus **-kæ*. See below for more information.

F. Eskimo: Proto-Eskimo **ki(na)* 'who' > Alutiiq Alaskan Yupik *kinaq* 'who'; Central Alaskan Yupik *kina* 'who'; Naukan Siberian Yupik *kina* 'who'; Central Siberian Yupik *kina* 'who'; Sirenik *kin* 'who'; Seward Peninsula Inuit *kina* 'who'; North Alaskan Inuit *kin^{y}a* 'who'; Western Canadian Inuit *kina* 'who'; Eastern Canadian Inuit *kina* 'who'; Greenlandic Inuit *kina* 'who'. Aleut *kiin* 'who'. Cf. Fortescue—Jacobson—Kaplan 1994:173—174. Proto-Eskimo **kitu* 'who' or 'which' > Alutiiq Alaskan Yupik *kitu-* 'who'; Central Alaskan Yupik *kitu-* 'who'; Naukan Siberian Yupik *kitu-* 'who'; Central Siberian Yupik *kitu-* 'who'; Seward Peninsula Inuit *kitu* 'which'; North Alaskan Inuit *kisu* 'which';

Eastern Canadian Inuit *kituuna* ‘who is that’; Greenlandic Inuit (North Greenlandic / Polar Eskimo) *kihu* ‘what’. Cf. Fortescue—Jacobson—Kaplan 1994:174. Proto-Inuit **qanuq* ‘how’ > Seward Peninsula Inuit *qanuq* ‘how’; North Alaskan Inuit *qanuq* ‘how’; Western Canadian Inuit *qanuq* ‘how’; Eastern Canadian Inuit *qanuq* ‘how’; Greenlandic Inuit *qanuq* ‘how’. Cf. Fortescue—Jacobson—Kaplan 1994:284. Proto-Eskimo **qaŋa* ‘when (in past)’ > Sirenik *qaŋən* ‘when (in past?)’; Seward Peninsula Inuit *qaŋa* ‘when (in past)’; North Alaskan Inuit *qaŋa* ‘when (in past)’; Western Canadian Inuit *qaŋa* ‘when (in past)’; Eastern Canadian Inuit *qaŋa* ‘when’; Greenlandic Inuit *qaŋa* ‘when (in past)’. Aleut *qana-* ‘which, where’, *qanayaam* ‘when’, *qanaaŋ* ‘how many’. Cf. Fortescue—Jacobson—Kaplan 1994:284. Proto-Eskimo **qaku* ‘when (in future)’ > Alutiiq Alaskan Yupik *qaku* ‘when (in future)’; Central Alaskan Yupik *qaku* ‘when (in future)’; Naukan Siberian Yupik *qaku* ‘when’; Central Siberian Yupik *qakun* ‘when (in future)’; Sirenik *qaku* ‘when’; Seward Peninsula Yupik *qaɣu(n)*, *qaɣuʁun* ‘when (in future)’; North Alaskan Inuit *qakuɣu* ‘when (in future)’; Western Canadian Inuit (Siglit) *qaku(ɣu)* ‘when (in future)’; Eastern Canadian Inuit *qaku* ‘when (at last, after lengthy waiting)’; Greenlandic Inuit *qaquɣu* ‘when (in future)’. Cf. Fortescue—Jacobson—Kaplan 1994:278. Proto-Yupik-Sirenik **qayu(q)* ‘how’ > Alutiiq Alaskan Yupik *qayu* ‘how’; Central Alaskan Yupik *qayumi* ‘indeed, as expected’; Naukan Siberian Yupik *qay* ‘I wonder, is that so?’, *qaywa* ‘really?, is that so?’; Central Siberian Yupik *qayuq* ‘how’; Sirenik *qayŋun* ‘really?’. Cf. Fortescue—Jacobson—Kaplan 1994:293.

16.60. Interrogative-relative stem **ʔay-*, **ʔya-* (Greenberg: §61. Interrogative J; Illič-Svityč 1971—1984.I:277—278, no. 142, **ja* interrogative and relative stem: ‘which, who’; Nafiqoff 2003:57—58 **ja*; Dolgopolsky 2008, no. 2616, **ya* ‘which?’)

This stem is one of the strongest Nostratic etymologies. The data supporting this etymology are extremely rich, and derivatives are found in nearly every branch of Nostratic. Rather than list all of the data, I will only give a summary here.

A. Afrasian: Proto-Afrasian **ʔay(y)-* interrogative-relative pronoun stem: ‘who, which, what; here; who?, which?, what?; where?’ > Proto-Semitic **ʔay(y)-* interrogative stem: ‘who?, which?, what?; where?’ > Hebrew *ʔē* ‘where?’; Aramaic *ʔē* ‘what?, where?, how?’, *ʔēχā* ‘where now?’; Syriac *ʔaynā* ‘what?’, *ʔaykā* ‘where?’; Ugaritic *ỉy* ‘where?’; Akkadian *ayyu* ‘who?, what?’; Arabic *ʔayy* ‘which?, what?’; Epigraphic South Arabian *ʔy* ‘whatsoever’; Geez / Ethiopic *ʔayy* ‘which?, what?, what kind?, what sort of?’; Tigre *ʔayi* ‘which?’; Tigrinya *ʔayyän*, *ʔayyä-nay* ‘which?’, also in: *nabäy* ‘whither?’ (from *nab ʔay*) and *kämäy* ‘how!’ (from *kämä ʔay*); Harari *āy* ‘which?’, *āyde* ‘where?’, *āyku(t)* ‘how?’; Gurage (Chaha) *e* ‘where?’ (cf. D. Cohen 1970— :16—17; Moscati 1964:114—115; Klein 1987:20; Leslau 1963:38, 1979:1, and 1987:49). Proto-

East Cushitic **ʔay(y)-* > Saho *ay* 'who?'; Boni *ay* 'who?'; Somali *ayy-o* 'who?'; Burji *áyye* 'who?'; Hadiyya *ay*, *ayy-e* 'who?' (cf. Sasse 1979:46 and 1982:30; Hudson 1989:167). This stem also occurs in Proto-Southern Cushitic **ʔayi* 'here', (combining form) **yi* 'here' > K'wadza *ayiye* 'here'; Ma'a *iʔi* 'here'; Dahalo **ji-* in *jiko* 'who?' (cf. Ehret 1980:288). Bender (2000:209) reconstructs an interrogative stem **ay* 'who?, what?, why?' for Proto-Omotic. Cf. Diakonoff 1988:83, §4.4.4.

B. Dravidian: Proto-Dravidian **yā-* interrogative stem: 'who?, which?, what?' > Kannaḍa *yā-*, *ā-*, *ē-*, *e-* interrogative base; Malayalam *yāvan*/*ēvan*, *yāvaḷ*/*ēvaḷ*, *yāvar*/*ēvar*/*yār*/*ār* 'who?', *yā*/*yātu*/*ētu*/*ēn* 'what?'; Tamil *yā*, *yāvai* 'what or which things?', *ēvaṉ* 'who?', *ēṉ* 'why?, what?, how?' (cf. Krishnamurti 2003: 256—258 **yaH-*/**yāH-*; Burrow—Emeneau 1984:465—467, no. 5151).

C. Kartvelian: Svan (interrogative) *jär* 'who?', (relative) *jerwäj* 'who', (indefinite) *jer* 'somebody, something', *jerē* 'someone, somebody', *jerwāle* 'anybody'.

D. Indo-European: Proto-Indo-European **ʔyo-* relative pronoun stem > Greek ὅς, ἡ, ὅ 'which'; Phrygian ιος 'which; this'; Sanskrit *yá-ḥ* 'which' (cf. Greenberg 2000:225—227; Pokorny 1959:283 **i̯o-*; Mann 1984—1987:452). According to Szemerényi (1996:210), among others, **yo-* is to be derived from the anaphoric stem **i-*. However, Greenberg successfully refutes this view.

E. Uralic: Proto-Finno-Ugrian relative and indefinite pronoun **yo-* 'who, which' > Finnish *jo-* in *joka* 'who, which', *joku* 'someone, anyone', *jos* 'when'; Lapp / Saami *juokkĕ* 'each, every'; Mordvin *ju-* in *juza toza* 'to and fro, back and forth'; Cheremis / Mari (Western) *juž*, (Eastern) *južə̑* 'someone, anyone' (cf. Greenberg 2000:227; Joki 1973:264; Rédei 1986—1988:637 **jo*).

F. Altaic: Proto-Altaic **yā-* interrogative stem: 'who?, which?, what?' > (a) Manchu *ya* 'which?, what?', *yaba* 'where?', *yade* 'where?, whither?, to whom?'; Evenki *ēma* (< **yāma*) 'what kind?', *ēdu* (< **yādu*) 'why?, for what?'; (b) Mongolian *yaγun* 'what?', *yambar* 'which?, what kind?'; Dagur *yō* 'what?'; Moghol *yan* 'what?, which?', *yem* ~ *yema* 'what?'; Ordos *yū* 'what?'; Buriat *yūŋ* 'which?'. Cf. Greenberg 2000:227; Poppe 1955:126, 226, 229, 230 and 1960:32, 33; Street 1974:29 **yā-* 'to do what?; who, what'. Starostin—Dybo—Mudrak (2003:754) derive the Manchu-Tungus forms cited above from Proto-Altaic **kʹa(j)* 'who?' (interrogative pronoun), while they (2003:2034) derive the Mongolian forms from Proto-Altaic **ŋ[i̯V]* 'what?, who?' (interrogative pronoun). In view of the data from other Nostratic languages, it seems more likely that a Proto-Altaic interrogative stem **yā-* needs to be reconstructed here to account for the Tungus and Mongolian forms. Proto-Altaic **kʰa(y)*, then, was the source of Proto-Tungus **χai* but not Proto-Tungus **yā-*. This agrees with the traditional etymology as opposed to what Starostin—Dybo—Mudrak propose.

The *CVC-* root structure patterning points to the ultimate verbal origin of this stem. I take it to be a derivative of an interrogative verbal stem **ʔay-* (~ **ʔəy-*) meaning 'to do what?, to act in what manner?' (cf. Bomhard—Kerns 1994:595—596, no. 468):

A. Dravidian: Proto-Dravidian **iya-* originally an interrogative verb stem meaning ‘to do what?, to act in what manner?’, later ‘to do, to effect, to cause, to induce, to cause to act; to be possible, to be proper’ > Tamil *iyal* ‘to be possible, to befall, to be associated with; to accept, to agree to, to approach, to resemble’, *iyalpu* ‘nature, proper behavior, goodness, propriety’, *iyalvu* ‘nature, means of attaining’, *iyarṟu* ‘to do, to effect, to cause to act; to control the movements of, to create, to compose’, *iyarṟi*, *iyarṟal* ‘effort’, *iyaṟkai* ‘nature, custom’, *iyai* ‘to join, to connect, to adapt’, *iyaipu* ‘union, harmony, appropriateness’, *iyaivu* ‘union, joining together’; Malayalam *iyaluka* ‘to agree, to go fairly, to be proper’, *iyal* ‘what is proper; nature, condition; strength, power’, *iyarṟuka* ‘to cause, to induce’, *iyappu* ‘joint, joining together’, *iyaykkuka* ‘to join’, *iyayuka* ‘to be agreeable, to harmonize’; Tuḷu *iyaruni*, *iyavuni* ‘to be sufficient’; Telugu *īya-konu*, *iyya-konu* ‘to consent’ (cf. Burrow—Emeneau 1984:45, no. 471).

B. Indo-European: Proto-Indo-European **ʔ(e)yo-* originally an interrogative verb stem meaning ‘to do what?, to act in what manner?’, later simply ‘to do, to make, to perform’ > Proto-Anatolian **iya- ~ *aya- ~ *ya-/*yē-* (< **HyeH-*) ‘to do, to make, to perform, etc.’ > Hittite (3rd sg. pres. active) *i-ya-(az-)zi*, *i-e-iz-zi* ‘to do, to make, to treat, to beget, to perform (duty, ritual), to celebrate (deity, feast)’; Luwian (3rd sg. pres. passive) *a-a-ya-ri* ‘to make’; Hieroglyphic Luwian *a(i)a-* ‘to make’; Lycian (3rd sg. pres.) *ati* (< **ayati*) ‘to make’; Lydian *i-* ‘to make’. The stem is also found in Tocharian A/B *yām-* ‘to do, to make, to commit, to effect’. Cf. Puhvel 1984— .1/2:335—347; Van Windekens 1976—1982.I:586; Adams 1999:490—492; Mallory—Adams 1997:362 **i̯eh$_1$-* ‘to do, to make; to act vigorously’; Tischler 1977— .2:338—343; Kloekhorst 2008b: 381—382.

C. Altaic: Common Mongolian **yaγa-*, **yeyi-* (< **yayi-*), **yeki-* interrogative verb stem (derived form — the root is **yā-*): ‘to do what?, to act in what manner?’ > Mongolian *yaki-*, *yeki-*, *yeyi-*, *yaγaki-* ‘how to act?, what to do?, how to proceed?’; Dagur *yā-* ‘to do what?’; Ordos *yā-*, *yā^{k}χi-* ‘to do what?’; Khalkha *yā-* ‘to do what’, *ī-* (< **yī-* < **yeyi-*) ‘to act in what manner?’; Monguor *yā-* ‘to do what?’; Buriat *yā-* ‘to do what?’; Kalmyk *yā-* ~ **yaγɒ-* ‘to do what?’. Cf. Poppe 1955:230—231; Street 1974:29 **yā-* ‘to do what?; who, what’.

16.61. Interrogative **mi-* (~ **me-*), relative **ma-* (~ **mə-*) (Greenberg: §62. Interrogative M; Illič-Svityč 1971—1984.II:66—68, no. 300, **mi* ‘what’; Dolgopolsky 2008, no. 1355, **mi* ‘what?’; Nafiqoff 2003:53—55 **mi*)

A. Afrasian: Proto-Afrasian **ma- ~ *mi-* interrogative and relative pronoun stem > Proto-Semitic **mă̆- ~ *mĭ̆-* interrogative and relative pronoun stem > Akkadian *mā* ‘what?, why?’, *man* ‘who?’; Arabic *mā* (interrogative) ‘what?’, (relative) ‘that, which, what’, *matā* ‘when?, at what time?’, *man* ‘who?, which one?, which ones?’; Ugaritic *mh* ‘what?’, *my* ‘who?’; Hebrew *māh* ‘what?, how?’; Sabaean *mhn* ‘what, what thing?’; Geez / Ethiopic *mi* ‘what?’, *mannu* ‘who?’, *mənt* ‘what?’. Egyptian *m* ‘who?, what?’. Berber: Tuareg *mi* ‘when?’,

ma ‘what?’; Tamazight *ma* ‘who?’. Proto-East Cushitic **maʔ* ‘what?’ > Kambata *maʾa* ‘what?’; Alaba *ma* ‘what?’; Sidamo *mai* ‘what?’; Gedeo / Darasa *maa* ‘what?’; Hadiyya *maha* ‘what?’; Somali *maḥaa* ‘what?’; Burji *míya* ‘what?’. Proto-East Cushitic **meʔ-* (or **meeʔ-*) ‘how many?’ > Burji *míʾa* ‘how many?’; Sidamo *meʾe* ‘how many?’; Kambata *meʾo* ‘how many?, how much?’; Dullay *meeʾe* ‘how many?’; Galla / Oromo *meek’a* ‘how many?’; Hadiyya *meeʾo* ‘how many?’. Proto-Highland East Cushitic **mi-ha* ‘why?’ > Hadiyya *mahi-na* ‘why?’; Kambata *mii(-ha)*, *mahiiha* ‘why?’; Burji *miyaa-ga* ‘why?’; Gedeo / Darasa *maya* ‘why?’; Sidamo *mae-ra* ‘why?’. Proto-Southern Cushitic **ma* ‘which?’ > Iraqw *-ma-* in *amaga* ‘how many?’, *ahema* ‘who?’, *asma* ‘why?’, *ama* ‘when?’; Ma’a *-ma* in *-hamá* ‘which?’, *-mo* in *kimomo* ‘how?’, (verb enclitic) *-mo* ‘how many?’; K’wadza *-ma-* in *gaʾamayo* ‘when?’. Proto-Southern Cushitic **me* ‘how many?’ > Ma’a *mé* ‘how many?’; Dahalo *méék’a* ‘how many?’. Proto-Southern Cushitic *mi* ‘what kind of?’ > Alagwa *mi* ‘what?’, *miya* ‘who?’; Iraqw *-mi-* in *amila* ‘what?’; K’wadza *-mi* in *homi* ‘what?’, *mi* ‘so that’. Proto-Chadic **mi*, **mə* ‘what?’ > Ngizim *t-âm* ‘what?’; Dangla *maa* ‘what?’; Ron *mi* ‘what?’; Margi *mi* ‘what?’; Bachama *munə* ‘what?’; Nancere *me*, *mene* ‘what?’; Zime *mi* ‘what?’. Perhaps also Ongota *mìyá* ‘how much?’. Cf. Ehret 1995:301, no. 571, **ma*, **mi* ‘what?’; Diakonoff 1988:83, §4.4.2; Lipiński 1997:328—331; Hudson 1989:83, 166, and 167; Sasse 1982:143 and 146; Ehret 1980:153, 157, and 158; Newman 1977:34; Fleming 2002b:50.

B. Kartvelian: Proto-Kartvelian **mi-n-* (?) interrogative pronoun: ‘who?’ > Georgian *vin-* ‘who?’; Mingrelian *mi(n)-* ‘who?’; Laz *min-* ‘who?’ (cf. Klimov 1964:135). (The Proto-Kartvelian form has also been reconstructed **wi-n-* or **wi-* [cf. Klimov 1998:53 **wi-n-*; Fähnrich—Sardshweladse 1995:135 **wi-*; Fähnrich 2007:162—163 **wi-*].) Proto-Kartvelian **ma-* ‘what’ > Georgian [*ma-*] ‘what’; Mingrelian *mu-* ‘what’; Laz *mu-* ‘what’; Svan *ma(j)*, *mäj* ‘what’ (cf. Klimov 1964:124 and 1998:112; Gamkrelidze—Mačavariani 1982:34; Fähnrich 2007:276; Fähnrich—Sardshweladse 1995:226—227).

C. Indo-European: Proto-Indo-European **me-*/**mo-* interrogative and relative pronoun stem > Cornish (conjunction) *ma*, *may* ‘that’; Breton (conjunction) *ma*, *may*, Middle Breton *maz* (from *ma+ez*) ‘that’; Tocharian B *mäksu* (a) interrogative pronoun: ‘which?, who?’, (b) interrogative adjective: ‘which?, what?’, (c) relative pronoun: ‘which, who’, B *mäkte* (a) interrogative pronoun: ‘how?’, (b) comparative: ‘as’, (c) causal: ‘because’, (d) temporal: ‘as, while’, (e) final: ‘so, in order that’, (f) manner: ‘how’, A *mänt*, *mät* ‘how?’; Hittite *maši(ya)-* ‘how much?, how many?’, *ma-a-an*, *ma-an* (adverb and conjunction) ‘how, whether, like, (even) as, if’. Cf. J. Friedrich 1952:138; Adams 1999:451 and 451—452; Kloekhorst 2008b:538—539 (*māḫḫan*), 552, and 564; Puhvel 1984— .6:39—43 and 6:94—97; Van Windekens 1976—1982.I:285—286 and I:287—288; Lewis—Pedersen 1937:127 and 241—242.

D. Uralic: Collinder (1965:141) reconstructs a Proto-Uralic **mi* ~ **my* (?) interrogative-relative stem (cf. Finnish *mikä* ~ *mi-* ‘which?, what kind?; which’; Lapp / Saami *mi* ~ *mâ-* ‘what, which, what kind; [that] which; which,

who, what'; Mordvin *meze* 'what'; Cheremis / Mari *ma*, *mo* 'what, which, what kind'; Votyak / Udmurt *ma* 'what, which, what kind'; Zyrian / Komi *myj* 'what, which, what kind'; Vogul / Mansi *män* 'which, what kind'; Ostyak / Xanty *mŏ̈gi* 'which, what', *mətä* 'any, which, who'; Hungarian *mi* 'what, which, what kind'; Tavgi Samoyed / Nganasan *ma* 'what'; etc.). Cf. Rédei 1986—1988:296 **mɜ*; Collinder 1977:54.

E. Altaic: Proto-Altaic **mV* interrogative stem > (a) Proto-Mongolian **-mu*, **-mi* suffixed interrogative particle > Middle Mongolian *-mu*, *-mi* suffixed interrogative particle; (b) Proto-Turkic **-mi* suffixed interrogative particle > Old Turkic *-mu* suffixed interrogative particle; Karakhanide Turkic *-mu* suffixed interrogative particle; Turkish *-mi*/*-mı*/*-mu*/*-mü* suffixed interrogative particle; Gagauz *-mi* suffixed interrogative particle; Azerbaijani *-mi* suffixed interrogative particle; Turkmenian *-mi* suffixed interrogative particle; Uzbek *-mi* suffixed interrogative particle; Uighur *-mu* suffixed interrogative particle; Karaim *-mo* suffixed interrogative particle; Tatar *-mi* suffixed interrogative particle; Bashkir *-mï* suffixed interrogative particle; Kirghiz *-bï* suffixed interrogative particle; Kazakh *-ma*/*-me* suffixed interrogative particle; Noghay *-ma*/*-me* suffixed interrogative particle; Oyrot (Mountain Altai) *-ba*/*-be* suffixed interrogative particle; Tuva *-be* suffixed interrogative particle; Chuvash *-im* suffixed interrogative particle. Starostin—Dybo—Mudrak 2003:958. Note also: Chuvash *měn*, *měsker* 'what?', *miśe* 'how much (in number)?', *měnšěn* 'why?', *měnle* 'what kind of?' (cf. Greenberg 2000:230; Larry Clark 1998:440).

F. Chukchi-Kamchatkan: Proto-Chukchi-Kamchatkan **mikæ* 'who?' > Chukchi *mik(ə)-* 'who?, someone'; Kerek *maki* 'who?'; Koryak *meki* (Kamen *maki*) (< **mæki*, metathesized form of **mikæ*) 'who?'; Alyutor *miɣɣa* 'who?', *mikin* 'whose'; (?) Kamchadal / Itelmen *k'e* (pl. *k'nəntx*) 'who?'. Cf. Fortescue 1998:154 and 2005:175; Greenberg 2000:231. As noted above, **mikæ* is a combination of **mi-* plus **-kæ*. Proto-Chukchi-Kamchatkan **miŋ(kə)* 'where?' > Chukchi *miŋkə* 'where?', *miŋkəri(lə)* 'to where?'; Kerek *miŋkiil* "to where?'; Koryak *miŋkə* 'where?', *miŋkəje* 'to where?', *meŋqo* 'from where?'; Alyutor *məʔannu* (Palana *miŋkə*, *meje*) 'where?', *maŋkət(əŋ)* 'to where?'; Kamchadal / Itelmen *maʔ* 'where?', *manke* 'to where?', *manxʔal* 'from where?'. Cf. Fortescue 2005:177. Proto-Chukchi-Kamchatkan **miŋkəði* 'how?' > Chukchi *miŋkəri* 'how?, what kind?'; Kerek *miŋkii* 'how'; Koryak *miŋkəje*'how?, what kind?'; Alyutor *maŋkət* 'how?'; Kamchadal / Itelmen (Sedanka) *mank* 'how?'. Cf. Fortescue 2005:177. Proto-Chukchi-Kamchatkan **mæŋin* 'what kind?' > Chukchi *meŋin* used as the suppletive absolutive case form of *mik(ə)-* 'who?, someone'; Kerek *maŋin ippa* 'which?'; Koryak *meŋin* 'what kind of?'; Alyutor *maŋin* 'what kind of?'; Kamchadal / Itelmen *min* 'what kind?'. Cf. Fortescue 2005:173.

G. Eskimo: Proto-Eskimo (enclitic) **-mi* 'what about?': Alutiiq Alaskan Yupik *+mi* 'I wonder, how about?'; Central Alaskan Yupik *+mi* 'how about?, contrast'; Naukan Siberian Yupik *#mi* '…or other' (with question words); Central Siberian Yupik *+mi* 'how about?, contrast'; Sirenik *+mi* emphatic

enclitic; Seward Peninsula Inuit (+)*mi* ‘why (not)?’; North Alaskan Inuit (Uummarmiut) +*mi* ‘what about?’; Greenlandic Inuit +*mi* ‘but, indeed, what about? (contrastive emphasis)’. Cf. Fortescue—Jacobson—Kaplan 1994:411.

Sumerian: Note the interrogative stem **me-* found in *me-na-àm* ‘when?’, *me-a* ‘where?’, *me-šè* ‘where to?’.

16.62. Interrogative-relative **na-* (~ **nə-*) (Greenberg: §64. Interrogative N; Dolgopolsky 2008, no. 1633, **ŋ[U]* (1) ‘thing’, (2) ‘what?’)

A. Afrasian: Semitic: Geez / Ethiopic *-nu* interrogative particle; Amharic *-nə* interrogative particle; Ancient Harari *-n* in *mist-n* ‘how much?’. East Cushitic: Burji *-na* positive affirmative copula; Sidamo *-ni* interrogative copula; Gedeo / Darasa *-n* positive affirmative copula (cf. Sasse 1982:150). Proto-Omotic **oon* ‘who?’ (cf. Bender 2000:197): Gemu nominative-accusative *oon+i/a* ‘who?’, (pl.) *oon+anta*; Kullo accusative *oni+n* ‘whom?’; Welaitta subject/object *oon+i/oon+a* ‘who?’. Note also the Mao (Hozo) interrogative stem *na* ‘when?’ (cf. Bender 2000:230). Ongota *na* ‘what?’, *neeni* ‘what?, why?’, *niike* ‘what?’ (cf. Fleming 2002b:61).
B. Indo-European: Proto-Indo-European interrogative particles **ʔan-*, **-ne*: cf. Latin *an* particle indicating alternative answers, *-nĕ* interrogative enclitic particle; Gothic *an* interrogative particle indicating uncertainty of speaker (cf. Ernout—Meillet 1979:30—31; Feist 1939:41; Lehmann 1986:30). Lindsay (1894:605) elaborates: “In class. Latin *-nĕ* is the general interrogative particle, while *nonnĕ* is limited to questions which expect an affirmative, *num* to those which expect a negative, answer.” Further on (1894:605—606), he notes: “*-Ne* is probably I[ndo-]Eur[opean] **nĕ* (Zend *-na* appended to Interrogatives, e.g. *kas-nā* ‘who then?’; cf. O[ld] H[igh] G[erman] *na weist tu na*, ‘nescisne?’)…” Finally (1894:606), he derives Latin *an* from the pronominal stem found in Lithuanian *añs* ‘that’, Old Church Slavic *onъ* ‘that’.
C. Altaic: Starostin—Dybo—Mudrak (2003:1034) reconstruct Proto-Altaic **ŋ[i̯V]* ‘what?, who?’ (interrogative pronoun) > (a) Proto-Tungus **ŋū̄* ‘who?’ > Evenki *ŋī*, *nī* ‘who?’; Lamut / Even *ńī*, *ŋī* ‘who?’; Negidal *nī*, *ŋī* ‘who?’; Manchu *we* ‘who?’ (*webe* ‘whom?’); Ulch *ŋui*, *ui* ‘who?’; Orok *ŋui* ‘who?’; Nanay / Gold *ui* ‘who?’; Oroch *ńī* ‘who?’; Udihe *nī* ‘who?’; Solon *nīχē* ‘who?’; (b) Proto-Turkic **nē-* ‘what; what?’ > Old Turkic (Orkhon, Old Uighur) *ne* ‘what; what?’; Karakhanide Turkic *ne* ‘what; what?’; Turkish *ne*, *neme* ‘what?; what, whatever, how’, *nere* ‘what place?, what part?’, *nekadar* ‘how much?’; Gagauz *ne* ‘what; what?’; Azerbaijani *nä* ‘what; what?’; Turkmenian *nā̈*, *nā̈mä* ‘what; what?’; Uzbek *ne* ‘what; what?’; Uighur *nä* ‘what; what?’; Karaim *ne* ‘what; what?’; Tatar *ni*, *nɛrsɛ* ‘what; what?’; Bashkir *ni*, *nämä* ‘what; what?’; Kirghiz *ne*, *neme* ‘what; what?’; Kazakh *ne* ‘what; what?’; Noghay *ne* ‘what; what?’; Oyrot (Mountain Altai) *ne*, *neme* ‘what; what?’; Chuvash *məʷn* (metathesis from **ne-me*) ‘what; what?’. Cf.

Starostin—Dybo—Mudrak 2003:1034 **ŋ[i̯V]* ‘what?, who?’ (interrogative pronoun). Proto-Turkic **nē-* ‘what; what?’ and its derivatives are likely to be archaisms since no other native forms in Turkic begin with *n-* (cf. Johanson 1998a:31). Róna-Tas (1998:74), on the other hand, remarks that “[i]t is unlikely that Old Turkic *ne* ‘what’ reflects a Proto-Turkic form, since it would be the only native Turkic word with initial *n*”. Décsy (1998:117) lists the following Old Turkic forms beginning with *n*: *nä* ‘what; what?’, *näčä* ‘how many?’, *näčük* ‘how?’, *näčükläti* ‘why?’, *nägü* ‘what sort?’, *nägüdä* ‘due to’, *nägül* ‘how?’, *nägülüg* ‘how?’, *nälük* ‘really?, or what?’, *nämä* ‘whatever’, *nämän* ‘wie?, wie!’, *nän* ‘not the least’, *nänčä* ‘according to’, *näŋäyü* ‘special’, *nätäg* ‘just as’.

D. Gilyak / Nivkh: (East and North Sakhalin) *nar* ‘who’, (East Sakhalin) *nunt*, *nud* ‘what’, (Amur) *aŋ*, *aγ* ‘who’ (cf. Gruzdeva 1998:28).

E. Eskimo: Proto-Eskimo **na-* ‘where’ > Alutiiq Alaskan Yupik *na-* ‘where’; Central Alaskan Yupik *na-* ‘where’; Naukan Siberian Yupik *na-* ‘where’; Central Siberian Yupik *na-* ‘which’; Sirenik *na-* ‘where’; Seward Peninsula Inuit *na-* ‘where’; North Alaskan Inuit *na-* ‘where’; Western Canadian Inuit *na-* ‘where’; Eastern Canadian Inuit *na-* ‘where’; Greenlandic Inuit (North / Polar Greenlandic) *na-* ‘where’ (cf. Fortescue—Jacobson—Kaplan 1994:204). Proto-Eskimo **nalliʁ* ‘which’ > Alutiiq Alaskan Yupik *naliq* ‘which (of them)’; Central Alaskan Yupik *naliq* ‘which (of them)’; Naukan Siberian Yupik *naliq* ‘which (of them)’; Central Siberian Yupik *naliq* ‘which (of them)’; Sirenik *nacaX* ‘which’; Seward Peninsula Inuit *nalliq* ‘which’; North Alaskan Inuit *nalli(q)* ‘which’; Western Canadian Inuit *nalliat* ‘which of many’; Eastern Canadian Inuit *nalli(q)* ‘which’; Greenlandic Inuit (North / Polar Greenlandic) *nalliq* ‘which’ (cf. Fortescue—Jacobson—Kaplan 1994:204). Proto-Eskimo **naɣu* and **na(C)uŋ* ‘where (is it)?’ > Central Alaskan Yupik *nauwa*, *nauxa* ‘where’; Naukan Siberian Yupik *naa* ‘where’; Central Siberian Yupik *naaɣu* ‘where is it?’; Seward Peninsula Inuit *nauŋ* ‘where have you come form?’; North Alaskan Inuit *nauŋ* ‘where’; Western Canadian Inuit *nauk* ‘where’; Eastern Canadian Inuit *nauk* ‘where’; Greenlandic Inuit *naak* ‘where’ (cf. Fortescue—Jacobson—Kaplan 1994:204). Proto-Yupik-Sirenik **natə* ‘which (part)’ > Alutiiq Alaskan Yupik *natə* ‘what part’; Central Alaskan Yupik *natə* ‘what part’; Central Siberian Yupik *natə* ‘where’; Sirenik *natəlŋuX* ‘which’, *natu* ‘where’ (cf. Fortescue—Jacobson—Kaplan 1994:204).

F. Etruscan: Relative pronoun *an* (*ana*, *ane*, *anc*, *ancn*, *ananc*) ‘who, which’ (also ‘he, she, this, that’) (cf. Bonfante—Bonfante 2002:214). Perhaps also in *nac* ‘how, as, because, since’.

Sumerian: I cannot help wondering whether the Sumerian inanimate interrogative stem *a-na* ‘what?’ may be related to the forms under discussion here. *a-na* can also be used as an indefinite or relative pronoun (cf. Thomsen 1987:75). Note also the indefinite pronoun (animate and inanimate) *na-me* ‘anyone, anything; (with negative verb) no one, nothing’ (cf. Thomsen 1987:78).

16.63. Indefinite **ma-* (~ **mə-*), **mi-* (~ **me-*), **mu-* (~ **mo-*) (not in Greenberg 2000; Illič-Svityč 1971—1984.II:70—71, no. 303, **mu* demonstrative pronoun: 'this, that'; Nafiqoff 2003:47—49 **mu*; Dolgopolsky 2008, no. 1510, **mu[wV]* 'this, that')

This may originally have been a demonstrative stem (as suggested by Illič-Svityč), with three degrees of distance: **ma-* (~ **mə-*) (proximate), (B) **mu-* (~ **mo-*) (distant), and (C) **mi-* (~ **me-*) (intermediate), as in the stems: **k^ha-* (~ **k^hə-*) (proximate), (B) **k^hu-* (~ **k^ho-*) (distant), and (C) **k^hi-* (~ **k^he-*) (intermediate) and **t^ha-* (~ **t^hə-*) (proximate), (B) **t^hu-* (~ **t^ho-*) (distant), and (C) **t^hi-* (~ **t^he-*) (intermediate), cited above.

A. Afrasian: Ehret (1995:300, no. 568) reconstructs a Proto-Afrasian indefinite pronoun stem **m-* 'one, someone, somebody' (cf. Ugaritic *mn* 'any, a certain'; Arabic *man* 'he/she/those who, the one who; those who'; Egyptian *mn* 'someone, so-and-so'). According to Lipiński (1997:330), "indefinite pronouns strictly speaking do not exist in Semitic. The forms used as a kind of indefinite pronouns are based on the interrogative pronoun" (see also Moscati 1964:115). Instead of being derived from the interrogative pronoun, as is commonly assumed, the Semitic forms may indeed be relics of an old indefinite (< demonstrative) stem as proposed by Ehret.
B. Kartvelian: Proto-Kartvelian **a-ma-* 'this, that', **ma-* pronominal stem of the third person: 'this, he; this one, that one': Georgian *ama-*/*am-* 'this, that', *ma-* 'this, he; this one, that one'; Mingrelian *amu-* 'this, that', *mu-* 'this, he; this one, that one'; Laz *(h)amu-* 'this, that', *mu-* 'this, he; this one, that one'; Svan *am(a)-* 'this, that' (cf. Klimov 1964:44 **a-ma-*, 124 **ma-* and 1998:2 **a-ma-* 'this, that', 112—113 **ma-* pronominal stem of the third person; Fähnrich—Sardshweladse 1995:226 **ma-*; Fähnrich 2007:276 **ma-*).
C. Indo-European (?): Welsh *ýma* (poetical *ýman*) 'here'; Breton *ma*, *mañ* 'here'; Cornish *ma* 'here'. Cf. J. Morris Jones 1913:433; Lewis—Pedersen 1937:221.
D. Uralic: Proto-Finno-Ugrian **mu* 'other, another' > Finnish *muu* '(somebody, something) else; other, another'; Estonian *muu* 'other, something (or somebody) else'; Lapp / Saami (Ume) *mubbe* 'one (of two); the other; another, other; (the) second' (contains the suffix of the comparative); Votyak / Udmurt (derivative) *myd*, *möd* 'other' (cf. Collinder 1955:100 and 1977:115; Rédei 1986—1988:281—282 **mu*).
E. Altaic: Common Turkic (**mū*/**mō* >) **bū*/**bō* 'this' > Middle Kipchak *bu* 'this'; Chagatay *bu* 'this'; Turkish *bu* 'this'; Azerbaijani *bu* 'this'; Turkmenian *bu* 'this' (oblique *mun-*); Tatar *bu* 'this'; Kazakh *bul* 'this'; Noghay *bu* 'this'; Kirghiz *bul* 'this'; Uzbek *bu* 'this'; Yakut *bu* 'this' (cf. Menges 1968b:121—122; Róna-Tas 1998:74; Décsy 1998:61; examples from Johanson—Csató 1998). Mongolian *mön* deictic particle serving as a demonstrative pronoun, adjective, adverb, and copula: 'just this one; certainly, surely, really'.

Sumerian: *mìn* 'other, another'.

16.64. Indefinite *$d^{y}i$- (~ *$d^{y}e$-) ‘this one, that one’ (not in Greenberg 2000)

A. Afrasian: Proto-Afrasian *$d^{y}i$- ‘this one, that one’ > Proto-Semitic *$d^{y}ā$, *$d^{y}ī$ ‘this one, that one’ > Arabic (m.) *ḏā*, (f.) *ḏī* ‘this one, this’; Hebrew (m.) *zeh*, (f.) *zōh*, (poetical) *zū* ‘this’; Biblical Aramaic *dā* ‘this’; Sabaean *ḏ* ‘(he) who, (that) which’; Mehri *ḏ(ə)*- ‘who, which, what’; Śḥeri / Jibbāli *ḏ*- ‘one who, whoever’; Ḥarsūsi *ḏ(e)*- ‘who, which, that’; Geez / Ethiopic *za*- ‘who, that, which’ (*ziʾa*- with possessive suffix pronouns), (m. sg.) *zə*-, (f. sg.) *zā*- ‘this’ (adj. and pronoun); Tigrinya *zə* ‘he who, that’, *ʾəzu* ‘this’; Gurage *za* ‘that, that one, that one here’, *zə* ‘this’; Harari *zi* ‘he, who, that’, *-zo* ‘the’. Cf. D. Cohen 1970— :324; Klein 1987:194; Leslau 1979:701 and 1987:629—630. Cf. Ehret 1995:260, no. 470, **ji* or **dzi* ‘one, someone, somebody’ (indefinite pronoun). Note: the putative Egyptian and Chadic cognates adduced by Ehret are not convincing.
B. Uralic: Proto-Uralic *$t^{y}e$/*$t^{y}i$ ‘this one, that one’ > Finnish *se*/*si*- ‘this, that, it’; Mordvin *śe* ‘this, that one’; Cheremis / Mari *sede* ‘this one, that one’; Ostyak / Xanty (Northern) *śĭ*, *śĭt* ‘this, that one’, (Southern) *t'i* ‘this one’; Tavgi Samoyed / Nganasan *sete* ‘he’, *seti* ‘both of them’, *seteŋ* ‘they’; Kamassian *šõõ* ‘that one here’. Cf. Collinder 1955:56 and 1977:73; Rédei 1986—1988:33—34 **će* ~ **ći*; Décsy 1990:109 **tje* ‘that’.

IX. INDECLINABLES

16.65. Post-positional intensifying and conjoining particle *$k^{wh}a$- (~ *$k^{wh}ə$-) (does not appear in Greenberg 2000 as a separate entity but is discussed under §60. Interrogative K; Illič-Svityč 1971—1984.I:325—326, no. 201, **ḳ/o/* post-positional intensifying and conjoining particle; Nafiqoff 2003:42 **ḳ/o/*)

This particle is derived from relative *$k^{wh}i$- (~ *$k^{wh}e$-), interrogative *$k^{wh}a$- (~ *$k^{wh}ə$-) (see above).

A. Elamite: Elamite coordinating conjunction *ku-da*, *ku-ud-da*, *ku-ut-te* ‘and’, assuming that it is a compound form composed of the elements **ku*- ‘and’ plus *da* ‘also’.
B. Kartvelian: Proto-Kartvelian **kwe* intensifying and affirming particle > Georgian *k(v)e*; Mingrelian *ko*; Laz *ko* (cf. Klimov 1964:198 and 1998:216; Fähnrich—Sardshweladse 1995:376—377; Fähnrich 2007:464).
C. Indo-European: Proto-Indo-European *$k^{wh}e$ intensifying and conjoining particle: ‘moreover, and, also, etc.’ > Sanskrit *ca* ‘and’; Greek -τε ‘and’; Latin *-que* ‘and, and also, and indeed’; Hittite *-k(k)u* ‘and’ (cf. Pokorny 1959:635—636; Walde 1927—1932.I:507—508; Mann 1984—1987:1021; Brugmann 1904:621—622 and 668 *$q^{u}e$; Watkins 1985:33 and 2000:44; Gamkrelidze—Ivanov 1984.I:353—354, I:365, I:366 and 1995.I:188; Fortson 2004:134 and 2010:149).

D. Uralic: Proto-Uralic *-*ka*/*-*kä* intensifying and conjoining particle > Finnish -*ka*/-*kä* in: *ei-kä* ‘and…not, nor’ (*ei…eikä* ‘neither…nor’), *jo-ka* (indefinite pronoun) ‘who?’; Lapp / Saami (Norwegian) *juo-kke* ~ *juo-kkĕ* ‘each, every’; Vogul / Mansi *ää-k*, *ää-ki* (in combination with a finite verb in the indicative mood) ‘not’; etc.
E. Altaic: As noted by Greenberg (2000:221), “[m]any languages of the Tungus group have -*ka* ‘but, and’” (cf. Evenki -*ka*/-*kä*/-*kö* intensifying particle).
F. Etruscan: Etruscan -*c* ‘and’ (cf. Bonfante—Bonfante 2002:104).

16.66. Particle *$k^{wh}ay$- ‘when, as, though, also’ (derived from *$k^{wh}i$- [~ *$k^{wh}e$-] relative pronoun stem, *$k^{wh}a$- [~ *$k^{wh}ə$-] interrogative pronoun stem) (not in Greenberg 2000)

A. Afrasian: Proto-Afrasian (?) *$k^{w}ay$- ‘when, as, though, also’ > Proto-Semitic **kay*- ‘in order that, for, when, so that’ > Akkadian *kī* ‘according to, concerning’; Hebrew *kī* ‘that, for, when’; Syriac *kay* ‘therefore’; Ugaritic *k*, *ky* ‘for, because, when, if, that’; Arabic *kay* ‘in order that, so that’; Sabaean *ky* ‘when’. Egyptian non-enclitic particle *kȝ* ‘so, then’.
B. Indo-European: Proto-Indo-European *$k^{wh}ay$- ‘when, as, though, also’ > Lithuanian *kaĩ* ‘when, as’; Old Church Slavic *cě* ‘as, as also’. Cf. Pokorny 1959:519; Walde 1927—1932.I:327; Mann 1984—1987:1039.

16.67. Particle *$ħar^{y}$-: (1) particle introducing an alternative: ‘or’, (2) conjoining particle: ‘with, and’, (3) inferential particle: ‘then, therefore’ (not in Greenberg 2000)

A. Afrasian: Egyptian *ḥr* ‘upon, in, at, from, on account of, concerning, through, and, having on it; because’. Cf. Hannig 1995:546; Erman—Grapow 1921:113 and 1926—1963.3:131—132; Faulkner 1962:174; Gardiner 1957:582.
B. Indo-European: Proto-Indo-European *$\breve{ħ}her$- [*$\breve{ħ}har$-]/*$\breve{ħ}ḫ_{\mathring{r}}$- ‘then, therefore; and’ > Greek ἄρα (Epic Greek ῥα [enclitic] and, before a consonant, ἄρ) inferential particle: (Epic usage) ‘then, straightway, at once’, (Attic usage) ‘then, therefore’ (much like οὖν, only less strongly); Lithuanian *ar*̃ ‘whether, if’, *ir*̃ ‘and, and then, and so’; Latvian *ìr* ‘and, and also’. Cf. Pokorny 1959:62; Walde 1927—1932.I:77; Mann 1984—1987:31 and 1105; Boisacq 1950:72; Frisk 1970—1973.I:127; Chantraine 1968—1980.I:100; Hofmann 1966:21.
C. Altaic: Proto-Altaic *$ar^{y}V$ ‘or’ > Proto-Turkic *$ar^{y}u$ ‘or’ > Old Turkic (Old Uighur) *azu* ‘or’; Karakhanide Turkic *azu* ‘or’; Tuva *azï* ‘or’. Cf. Starostin—Dybo—Mudrak 2003:316 **arʹV* ‘or’.

16.68. Particle *ʔ*in*- (~ *ʔ*en*-), **(-)ni* ‘in, into, towards, besides, moreover’ (originally a nominal stem *ʔ*in-a* meaning ‘place, location’) (not in Green-

berg 2000 as a separate entry; Dolgopolsky 2002:48—49 **ʔin[ṅ]a/ä* ‘place’ [→ ‘in’ in daughter languages])

This form underlies locative **-ni* (see above, §16.29).

A. Afrasian: Semitic: Akkadian *ina* ‘in, on, from, by’; Geez / Ethiopic *ʾən-* … *-ta* ‘through, by way of, by, at, into, in the direction of, because’; Tigre *ʾət* ‘on, in, by, with, because of’. Egyptian *ỉn* ‘in, to, for, because, by’.
B. Indo-European: Proto-Indo-European **ʔen-* ‘in, into, among, on’ > Greek ἐν, ἔνι, ἐνί ‘in, on, among, into, and, besides, moreover’; Latin *in* ‘in, on, among, into, on to, towards, against’; Old Irish *ini-*, *en-*, *in-* ‘in, into’; Gothic *in* ‘in’; Old English *in* ‘in, on, among, into, during’; Old High German *in* ‘in’; Old Prussian *en* ‘inside, within’. Cf. Pokorny 1959:311—314; Walde 1927—1932.I:125—127; Mann 1984—1987:241; Watkins 1985:17 and 2000:23.
C. Uralic: Proto-Finno-Ugrian **[i]nɜ* ‘place’ > Votyak / Udmurt *in*, *iń* ‘place, spot’; Zyrian / Komi (Sysola) *-in* in: *kos-in* ‘dry place, dry land’, (Letka) *in* ‘place, spot’; (?) Hungarian (dialectal) *eny*, *enyh* ‘shelter; covered or sheltered place where men and animals take cover from wind, rain, snow, or heat’. Cf. Rédei 1986—1988:592—593.

16.69. Sentence particle **wa* (~ **wə*) ‘and, also, but; like, as’ (not in Greenberg 2000; Dolgopolsky 2008, no. 2452, **wa* ‘also, same’ [(in descendant languages) → ‘and’])

A. Afrasian: Proto-Afrasian sentence particle **wa* ‘and, also, but’ > Proto-Semitic sentence particle **wa* ‘and, also, but’ > Arabic *wa* ‘and, and also, with’; Hebrew *wə* ‘and, also, even, and indeed, with, and in addition, but’; Geez / Ethiopic *wa-* ‘and’. Cushitic: Beja / Beḍawye *wå* ‘and’. Cf. Klein 1987:189; D. Cohen 1970— :473—480; Leslau 1987:602; Reinisch 1895:236.
B. Kartvelian: Georgian enclitic particle *-ve*.
C. Indo-European: Proto-Indo-European sentence particle **we*, **u* ‘and, also, but; like, as’ > Sanskrit *va* ‘like, as’; Gothic enclitic particle *-u*; Tocharian B *wai* ‘and’. Cf. Pokorny 1959:73—75; Walde 1927—1932.I:187—189.

16.70. Coordinating conjunction **ʔaw-*, **ʔwa-* (~ **ʔwə-*) ‘or’ (not in Greenberg 2000)

A. Afrasian: Proto-Semitic **ʔaw-* ‘or’ > Arabic *ʾaw* ‘or’; Hebrew *ʾō* ‘or’; Akkadian *ū* ‘or’; Tigrinya *wäy* ‘or’. Cf. D. Cohen 1970— :11; Murtonen 1989:84—85; Klein 1987:9; Leslau 1987:47. East Cushitic: Saho *oo* ‘or’.
B. Indo-European: Proto-Indo-European **ʔwe* ‘or’ > Sanskrit *-vā* ‘or’; Latin *-ve* ‘or’. Cf. Pokorny 1959:75; Walde 1927—1932.I:188—189; Burrow 1973:284.
C. Uralic: Finnish *vai* ‘or’; Estonian *või* ‘or’.

CHAPTER SEVENTEEN

NOSTRATIC MORPHOLOGY II: RECONSTRUCTIONS

17.1. INTRODUCTION

In the preceding chapter, morphological evidence from the Nostratic daughter languages was gathered together. In this chapter, a systematic reconstruction of Proto-Nostratic morphology will be attempted based upon that evidence.

According to Dolgopolsky (1994:2838):

> The parent language had, most probably, an analytic grammatical structure with a strict word order (sentence-final predicate; object preceding the verb; nonpronominal attribute preceding the head; a special position for unstressed pronouns) and with grammatical meanings expressed by word order and auxiliary words (e.g., postpositions: **nu* for genitive, **ma* for marked accusative, and others). In the descendant languages this analytic grammar evolved towards a synthetic one.

My own research tends to support Dolgopolsky's views. The evidence indicates that, in its earliest phases of development, the Nostratic proto-language had mostly an analytic morphological structure, though, in its latest phases, a certain amount of evolution toward a synthetic structure must already have taken place, inasmuch as a synthetic grammatical structure is reconstructed for Afrasian, which was the earliest branch to separate from the rest of the Nostratic speech community. That a good deal of this evolution took place within Proto-Afrasian proper is beyond doubt, inasmuch as a variety of analytic formations can be found in other branches of Nostratic, some of which can be traced back to the Nostratic parent language.

17.2. PROTO-NOSTRATIC AS AN ACTIVE LANGUAGE

The assumptions we make about the morphological and syntactical structure of a given proto-language profoundly affect the reconstructions that we propose. For example, in what follows, I will be proposing that Proto-Nostratic was an active language. Now, active languages exhibit specific characteristics (see below) that set them apart from other morphological types. Therefore, it follows that the reconstructions I posit will conform with an active structure. However, I believe quite emphatically that reconstructions must never be driven by theory alone. Rather, they must be fully consistent with the supporting data. Moreover, not only must our reconstructions be consistent with the supporting data, they must be consistent from a typological perspective as well, and they must be able to account

for later developments in the descendant languages in as straightforward a manner as possible, without recourse to ad hoc rules. When reconstructions are driven by theory alone, the results can be disastrous. Here, I will mention first the Moscow School reconstruction of the Proto-Nostratic obstruent system as an example. On the basis of a few seemingly solid cognates in which glottalized stops in Proto-Afrasian and Proto-Kartvelian correspond to what are traditionally reconstructed as plain voiceless stops in Proto-Indo-European, Illič-Svityč assumes that voiceless stops in the Indo-European data he cites always means that glottalized stops are to be reconstructed in Proto-Nostratic, even when there were no corresponding glottalized stops in Afrasian and Kartvelian. He goes so far as to set up an ad hoc rule to account for counter-examples. Another example is Décsy's 2002 book on Afrasian. Here, Décsy makes certain ad hoc assumptions about what must have existed in language in general at a certain time depth and then applies those assumptions to his reconstruction of Proto-Afrasian. Though it is not known where or when human language first appeared, the fossil record indicates that anatomically modern humans have been around for at least 200,000 years, perhaps longer. That is more than enough time for language to develop. To assume that complicated linguistic structures could not have existed 12,000 years ago, a mere fraction of the length of time that our species has been on this planet, is not a view that I can support. It should be noted here that this criticism does not apply to Décsy's books on Uralic (1990), Indo-European (1991), and Turkic (1998) in the same series.

Several scholars have recently presented persuasive arguments in favor of reconstructing an early phase of Proto-Indo-European as an active language (cf. especially Karl Horst Schmidt 1980; Gamkrelidze—Ivanov 1995; Lehmann 1995 and 2002; and Pooth—Kerkhoff—Kulikov—Barðdal 2018). Proto-Afrasian is also assumed to have been an active language (cf. Diakonoff 1988:85), as is Elamite (cf. Khačikjan 1998:61—66). Moreover, Nichols (1992:314, note 3) classifies Georgian as active. In active languages, subjects of both transitive and intransitive verbs, when they are agents semantically, are treated identically for grammatical purposes, while non-agent subjects and direct objects are treated differently (cf. Trask 1993:5—6). An "agent" may be defined as the entity responsible for a particular action or the entity perceived to be the cause of an action (cf. Trask 1993:11).

Thus, there are two types of intransitive verbs in active languages (also called "Split-S" or "Fluid-S" languages) (this will be explained in more detail below):

1. Those whose subjects have the same grammatical marking as the subjects of transitive verbs. These are Trask's "agent [subjects]". This type is referred to in this chapter as "active constructions".
2. Those whose subjects have the same grammatical marking as direct objects of transitive verbs. These are Trask's "non-agent subjects". This type is referred to in this chapter as "stative constructions".

To complicate matters, some verbs are "ambitransitive", that is, they can occur in either a transitive clause or an intransitive clause. Semantic and morphosyntactic considerations play an important role here.

Trask's (1993:5—6) complete description/definition of active type languages is as follows:

> active language *n.* (also agentive language) A language in which subjects of both transitive and intransitive verbs which are semantically agents are treated identically for grammatical purposes, while non-agent subjects and direct objects are treated differently. Among languages exhibiting this pattern are Sumerian, Batsbi (NE Caucasian), Crow (Siouxan) and Eastern Pomo (Hokan). The following examples from Eastern Pomo show the use of the two subject pronouns *há:* 'I' (agent) and *wí* 'I' (non-agent): *Há: mí:pal šá:ka* 'I killed him'; *Há: wádu:kìya* 'I'm going'; *Wí ʔéčkiya* 'I sneezed'. The correlation is rarely perfect; usually there are a few verbs or predicates which appear to be exceptional. In some active languages lexical verbs are rigidly divided into those taking agent subjects and those taking non-agent subjects; in others some lexical verbs can take either to denote, for example, differing degrees of control over the action. See Merlan (1985) for discussion. Cf. ergative language, accusative language, and see also split intransitive, fluid-intransitive. Sapir (1917).

Nichols (1992:9—10) lists the sets of typical features of active type languages established by Klimov (1977) as follows:

Lexical properties:

1. Binary division of nouns into active vs. inactive (often termed *animate* and *inanimate* or the like in the literature).
2. Binary division of verbs into active and inactive.
3. Classificatory verbs or the like (classification based on shape, animacy, etc.).
4. Active verbs require active nouns as subject.
5. Singular-plural lexical suppletion in verbs.
6. The category of number absent or weakly developed.
7. No copula.
8. "Adjectives" are actually intransitive verbs.
9. Inclusive/exclusive pronoun distinction in first person.
10. No infinitive, no verbal nouns.
11. Etymological identity of many body-part and plant-part terms (e.g., "ear" = "leaf").
12. Doublet verbs, suppletive for animacy of actant.

Syntactic properties:

13. The clause is structurally dominated by the verb.
14. "Affective" (inverse) sentence construction with verbs of perception, etc.
15. Syntactic categories of nearer or farther object rather than direct or indirect object.
16. No *verba habiendi*.
17. Word order usually SOV.
18. Direct object incorporation into verb.

Morphological properties:

19. The verb is much more richly inflected than the noun.
20. Two series of personal affixes on the verb: active and inactive.
21. Verbs have aspect or Aktionsarten rather than tense.
22. The noun has possessive affixes.
23. Alienable-inalienable possession distinction.
24. Inalienable possessive affixes and inactive verbal affixes are similar or identical.
25. Third person often has zero affix.
26. No voice opposition (since there is no transitivity opposition). Instead, there can be an opposition of what is called *version* in Kartvelian studies (roughly active vs. middle in the terminology of Benveniste 1966, or an opposition of normal valence vs. valence augmented by a second or indirect object, or an opposition of speech-act participant vs. non-participant in indirect-object marking on the verb).
27. Active verbs have more morphological variation or make more morphological distinctions than inactive verbs.
28. The morphological category of number is absent or weakly developed.
29. There are no noun cases for core grammatical relations (no nominative, accusative, genitive, dative). Sometimes there is an active/inactive case opposition.
30. Postpositions are often lacking or underdeveloped in these languages. Some of them have adpositions inflected like nouns.

Nichols (1992:8) notes that Klimov's definition of active type languages is close to, though not identical with, her definition of dominant stative-active alignment (see also Nichols 1992:8—9):

> According to Klimov, the basic determinant of linguistic type is what I call the *conceptual cast* of a language's predictions and its categorization of basic nominal and verbal notions; whether they are based on subject-object relations, agent-patient relations, an active/inactive distinction, referential properties, or others. The salient indicator of the conceptual cast is the stative-active, ergative, or accusative alignment of the clause, and this in turn determines the occurrence of a number of other categories. The whole set of properties — conceptual cast, alignment type, and attendant categories — constitutes the *type* of the language. (Klimov 1977 divides the relevant grammatical features into those that are more or less direct implicanda of type and those that are frequently observed secondary properties.) There are four basic types: the ACCUSATIVE TYPE, which grammaticalizes subject-object relations, the ERGATIVE TYPE, which grammaticalizes agent-factitive relations (for *factitive* — a semantic role essentially coinciding with the formal category of S/O of Dixon 1979 — see Kibrik 1979); the ACTIVE TYPE, which grammaticalizes an active/inactive or animate/inanimate principle; and (singled out only in the 1983 book) the CLASS TYPE, based on referential properties of nominals and having well-developed gender or class inflection. The first three types are named for their typical clause alignments, but in Klimov's view clause alignment is merely one of several symptoms (albeit a salient one) of the

> conceptual cast and hence type. Thus the active type is almost identical in extension but different in intension from the set of languages exhibiting stative-active alignment. Since the active type is focal in Klimov's sense, I will use his term *active* in his sense while using *stative-active* in what I take to be the current standard sense. Klimov carefully distinguishes type from features, faulting most contemporary typology for failing to make this distinction and pointing out that much of what is called typology is actually the cross-linguistic study of features rather than types. A type, in Klimov's view, is a set of independent but correlated features from different levels of grammar accompanied by a theory explaining the correlation.
>
> What is of particular interest to cross-linguistic comparison is the sets of typical features Klimov establishes for each type. For instance, he shows that the active type is associated with underdevelopment of number inflection, an inclusive/exclusive opposition in pronouns, an opposition of alienable to inalienable possession, classificatory verbs, grammaticalized animacy in nouns, and other features. The active and class types display the largest number of distinctive, interesting, and testable properties, and it is these traits that will be surveyed here.

Nichols (1992:65—66) describes various types of clause alignment as follows — note, in particular, her description of stative-active alignment (e):

> 2.0.4. *Clause alignment*. This term (taken from relational grammar) will be used here as generic for accusative, ergative, stative-active, etc. Only morphological alignment is surveyed in this study. The following categories are used, based on the morphological distinction or nondistinction of A, O, S (as those abbreviations are used by Dixon 1979 to refer to subject of transitive, direct object, and subject of intransitive respectively). The first five are standard and the last, hierarchical, is a well-described pattern with no standard label (Mallinson and Blake 1981 use the term *relative-hierarchical*).
>
> (a) Neutral: A = O = S, i.e., no inflectional oppositions.
> (b) Accusative: S = A; O distinct.
> (c) Ergative: S = O; A distinct. When a language has a major tense- or person-based ergative/accusative split and both patterns are salient, I count the language as primarily ergative, on the grounds that (following Silverstein 1976) most ergative systems are split and hence the split is part of the definition of "ergative".
> (d) Three-way: A, O, and S all distinct.
> (e) Stative-Active: S_1 = A, S_2 = O, the language has two different kinds of intransitive verbs, one taking ordinary subject marking (or the same subject marking as used with transitive verbs) and the other taking a subject whose marking is the same as that of the direct object of a transitive. The choice of S_1 or S_2 is usually determined by the verb: "stative" verbs take S_2, "active" verbs S_1. (For this definition see Merlan 1985.)
>
> If S_1 = A is the clear majority type in stative-active languages, the language can be described as having an accusative bias or slant: most intransitive subjects are formally identical to transitive subjects, so for the

most part S = A. If S_2 = O is the clear majority type, the language has an ergative bias. I will speak of such languages as being stative-active on an accusative BASE or stative-active on an ergative base.

(f) Hierarchical: Access to inflectional slots for subject and/or object is based on person, number, and/or animacy rather than (or no less than) on syntactic relations. The clearest example of the hierarchical type in my sample is Cree. The verb agrees in person and number with subject and object, but the person-number affixes do not distinguish subject and object; that is done only by what is known as direct vs. inverse marking in the verb. There is a hierarchical ranking of person categories: second person > first person > third person. The verb takes direct marking when subject outranks object in this hierarchy, and inverse marking otherwise. In addition, verbs inflect differently depending on whether their S and O arguments are animate or not, a pattern which could be viewed either as another instance of hierarchical agreement or as different conjugation classes (rather than hierarchical access to agreement slots).

Next, Nichols (1992:100—105) describes head/dependent marking and alignment with regard to the various types of clause alignment mentioned above as follows (the tables given in the original are omitted here):

> The frequencies of the dominant alignment types exhibited by the various head/dependent types are shown in table 18. The accusative alignment has almost the same distribution as the total of all three alignment types; in other words, its distribution is not affected by head/dependent marking and we can conclude that it is equally compatible with all head/dependent types. The ergative alignment favors dependent-marking morphology: of the 28 ergative languages in the sample, 16 are dependent-marking and only four are strongly head-marking (Abkhaz, Wishram, and Tzutujil, all with 0.0 proportions; Yimas with 0.25). The ergative type is well installed and stable in these languages, however: the first three (Abkhaz, Wishram, Tzutujil) belong to well-described families (Northwest Caucasian, Chinookan, Mayan) that are consistently ergative.
>
> The stative-active and hierarchical types strongly prefer head-marking morphology, consistent with the fact that the verb is the favored part of speech for showing stative-active marking. It is of course possible for a dependent-marking language to have stative-active dominant alignment. The dependent-marking stative-active languages in my sample, plus one (Batsbi; see Holisky 1987) not in my sample, are listed below, with their head/dependent ratios, alignment of noun and verb, and whether the structural semantics of the oppositions is of the split-S or fluid-S type in the terms of Dixon 1979.
>
> The fluid-S type is rare overall among stative-active languages (Merlan 1985), and these examples show that the fluid-S type has a strong affinity for case-marking languages. Head-marking stative-active languages are split-S with only one exception. Acehnese uses head marking to implement a fluid-S type (Durie 1985:185ff.). We can conclude that the unmarked kind of stative-active language is head-marking and split-S.
>
> The correlation of head/dependent marking and alignment emerges more clearly if we plot the head-marking points in the clause against the alignment

of the verb, as shown in table 19. The high frequency of neutral alignment in languages with no head marking in the clause is to be expected by definition: a language having no clause head marking has no marking on the verb, and no marking is neutral alignment. What requires comment is the non-neutral examples with zero clause head-marking. These include two languages that use detached marking, which I somewhat arbitrarily counted as marking of alignment on the verb. These two languages are Haida (stative-active) and Luiseño (accusative). Otherwise, once again the distribution of the accusative alignment is much like that of the total, and the stative-active and hierarchical alignments are concentrated in the head-marking end of the scale (higher numbers of H points in S). The ergative alignment is fairly evenly distributed throughout the scale except that it does not occur in languages with zero head marking in the clause (since ergativity cannot be marked on the verb if the verb has no marking).

It is apparently possible to combine any of the three major alignment types with any head/dependent type, though there are preferred and dispreferred combinations and there are gaps (which I interpret as accidental) in the distribution of the low-frequency types. The accusative alignment is equally compatible with all types, as is consistent with its generally preferred and unmarked status. The less frequent types have interesting asymmetries and limitations. The ergative alignment favors dependent marking. This is consistent with the fact that ergative, of all alignment types is prone to be marked on the noun (see §2.3.1), and this in turn may have to do with the fact that ergative alignment grammaticalizes nominal semantic roles. Stative-active and hierarchical alignments prefer head marking, and this is consistent with what they grammaticalize: the stative-active type grammaticalizes lexical categories of verbs, and the hierarchical type grammaticalizes relative ranking (for referential properties: animacy, person, etc.) rather than absolute functional status of clause arguments. The dependent-marked stative-active type is generally fluid-S, which is to say that it codes nominal semantic roles and not verb categorization. In general, the alignments that favor marking on nominals (ergative; fluid-S stative-active) are associated with grammaticalization of nominal semantic functions; those that favor marking on verbs are associated with the grammaticalization of verbal semantics and/or the semantics of the whole clause. Thus we have a functional explanation, albeit a rather abstract one. But on a more general level, the distributional constraints on alignment types suggest that there is some kind of consistency between the morphological form of coding (head-marked or dependent-marked) and the semantics coded; fluid categories and NP relational semantics favor dependent marking, while split categories and verbal notions favor head marking. If the function of the part of speech bearing the marking influences the semantics coded, it is also true that the form of the coding, specifically its location, restricts its possible semantics.

The correlation of stative-active type with head marking and ergative with dependent marking is difficult to demonstrate areally, partly because nonaccusative alignments are not common enough to form clear patterns in any but the largest areas and partly because ergative and stative-active alignments are roughly in complementary distribution across the areas. Table 20 shows that wherever the ergative alignment is at all frequent it is associated with

> dependent marking, and wherever the stative-active alignment is frequent it is associated with head marking. Even when neither is frequent, as in the smaller areas, there is still conformity in that in most cases the few stative-active entries are no more dependent-marking, and often more nearly head-marking, than the few ergative entries. The only counterexample is the Caucasus. The correlation emerges as significant by Dryer's test (reliably so if only the six continent-sized areas are considered; less reliably, but numerically more strongly, if all areas are counted).
>
> As mentioned in §2.0.4, stative-active languages can be described as having an ergative or accusative base, depending on whether the object-inflecting ("stative") or subject-inflecting ("active") set of intransitives is an open set. A base alignment can also be determined by considering the nominal and pronominal inflection, and sometimes also the inflection of transitive verbs. Information on closed and open classes of intransitives is not always available, but where available it indicates that most stative-active languages have an accusative base. Inflectional paradigms yield the same conclusion: ergative base alignment is rare outside of the Old World (where it is found in Georgian and Elamite). Languages with hierarchical dominant alignment have an accusative or neutral base without exception.

Regarding Georgian, Nichols (1992:314, note 3) remarks:

> Georgian is classified as stative-active because of its split transitivity. Hewitt 1987 gives detailed arguments against it on the grounds that the semantics of agent and patient does not determine case choice in intransitive subjects, but my definition of stative-active is not based on nominal semantic roles. Klimov 1977, 1983a classifies Georgian as belonging to the active type, although his classification is not based entirely on alignment: see the summary of his typology in §1.1.1 above.

Finally, Nichols (1992:116—117) discusses alienable and inalienable possession and its relationship to stative-active structure:

> Klimov 1977 finds that an opposition of alienable/inalienable possession is associated with the stative-active type. Nichols 1988, a survey limited to North America and Northern Eurasia, argues that the association is rather with head/dependent marking: inalienable possession almost always involves head marking, and head marking in NP's almost always entails an alienable/inalienable opposition. Chappell and McGregor 1989 give a more comprehensive structural analysis along comparable lines, placing alienable and inalienable possession in a hierarchy which continues on to lexical compounds and classificatory nouns. (Welmers 1971:132ff. finds evidence for a further connection — in this case historical rather than typological — of bound vs. free possession with nominal classes.) The present survey has supported most of the findings of Nichols 1988 and Chappell and McGregor 1989. Only possessive constructions taking the form of NP's are surveyed here.
>
> In the literature, the opposition of inalienable to alienable possession is generally presented as a semantic one, but Chappell and McGregor 1989 and

> Nichols 1988 show that it is best approached as a structural opposition rather than a semantic one. Languages with an opposition of inalienable to alienable possession have split systems of possession marking, and alienable and inalienable are not cross-linguistic semantic constants but simply the extremes of the nominal hierarchy defined by the splits. The term *inalienable*, then, refers not to a semantic constant having to do with the nature of possession, but to whatever set of nouns happens to take inalienable possession marking in a given language. In terms of its grammatical form, inalienable possession always involves a tighter structural bond or closer connection between possessed and possessor, and the tightness of the bond can be described in terms of head and dependent marking. One of the most common patterns is that where possession is head-marked and there is no formal difference between alienable and inalienable possession, other than that there is an inalienable set of nouns that cannot occur with possessive affixation while alienables can be used alone. In some languages there is a formal difference between alienable and inalienable possessive affixes: both are head-marking, and those for inalienables are shorter, simpler, or more archaic than those for alienables…
>
> There are several recurrent types of splits in the marking of possession, and all of them lend themselves to a single generalization: the inalienables take marking which is more nearly head-marking or less dependent-marking than the marking of alienables. Commonly, inalienable possession is head-marked while alienable is dependent marked…
>
> The generalizations to be made about inalienable possession thus resemble, in the abstract, those made in §3.2 about the stative-active alignment: both are associated with head marking, and both involve split rather than fluid systems. Stative-active alignment is typically but not necessarily split (occasionally as fluid, as in Batsbi, Acehnese, Eastern Pomo, and Tonkawa) and typically but not necessarily associated with head marking (occasionally with dependent marking, as in Batsbi, Eastern Pomo, and Tonkawa). Inalienable possession appears to be necessarily split (never fluid) and necessarily associated with head/dependent marking. The correlation with head/dependent marking is shown in the fact that no language in my sample (and no language that I know of) uses only dependent marking to implement an alienable/inalienable distinction. (A language that did so would have two genitive cases, one for alienables and one for inalienables.) Inalienable possession is split rather than fluid in that the choice of marking is determined by the possessed noun rather than by the speaker's decision about semantics. No language has what one would want to call fluid possessive marking, which would require the speaker to decide, for each possessed noun, whether (say) the possessor could part with the possessed item, whereupon the speaker would choose the formal marking accordingly…

Additional information on the salient morphological characteristics of active type languages is presented at the beginning of Chapter 20, especially as it pertains to positing an active-type structure for an early period of development in Proto-Indo-European. See also Andréasson 2001, Donohue—Wichmann (eds.) 2008, Dixon 1994, and Dixon—Aikhenvald (eds.) 2000, 2003, and 2009. For information on the typologically rare marked-S languages, cf. Handschuh 2014.

The distribution of agent and patient markers (cases) in an accusative system, an ergative system, and an active system may be summarized as follows:

<table>
<tr><td colspan="2"></td><td>Accusative</td><td>Ergative</td><td colspan="2">Active</td></tr>
<tr><td rowspan="2">Subject</td><td>Transitive</td><td rowspan="2">Nominative</td><td>Ergative</td><td rowspan="2">Agentive</td><td></td></tr>
<tr><td>Intransitive</td><td rowspan="2">Absolutive</td><td rowspan="2">Patientive</td></tr>
<tr><td colspan="2">Object</td><td>Accusative</td><td></td></tr>
</table>

17.3. ABLAUT IN PROTO-NOSTRATIC

An analysis of the Afrasian data seems to indicate that there was an alternation between the vowels **a*, **i*, and **u* in Proto-Afrasian roots and that that alternation may have had some sort of morphological or semantic significance. This is most evident in the Proto-Afrasian reconstructions proposed by Orël—Stolbova (1995), where different root vowels are sometimes posited by them for two (or more) stems, all of which are clearly variants of the same root. Each stem is listed by them as a separate entry, though the stem is usually cross-referenced to the related entry or entries. At the present state or research, however, it is simply not possible to ascertain the details of that patterning and what that patterning may have signified. In this book, Proto-Nostratic roots are reconstructed with stable vowels (and their subphonemic variants). Tone may also have played a role in Proto-Nostratic.

17.4. ROOT STRUCTURE PATTERNING IN PROTO-NOSTRATIC

As noted in Chapter 12, §12.3, comparison of the various Nostratic daughter languages makes it possible to determine the rules governing the structural patterning of roots and stems in Proto-Nostratic. Most likely, the patterning was as follows:

1. There were no initial vowels in Proto-Nostratic. Therefore, every root began with a consonant.
2. There were no initial consonant clusters either. Consequently, every root began with one and only one consonant. Medial clusters were permitted, however.
3. Two basic root types existed: (A) **CV* and (B) **CVC*, where *C* = any non-syllabic, and *V* = any vowel. Permissible root forms coincided exactly with these two syllable types.
4. A stem could either be identical with a root or it could consist of a root plus a single derivational morpheme added as a suffix to the root: **CVC*+*C*-. Any consonant could serve as a suffix. Note: In nominal stems, this derivational suffix was added directly to the root: **CVC*+*C*-. In verbal stems, it was added to the root plus formative vowel: **CVC*+V+*C*-.
5. A stem could thus assume any one of the following shapes: (A) **CV*-, (B) **CVC*-, (C) **CVC*+*C*-, or (D) (reduplicated) **CVC*-*CVC*-. As in Proto-Altaic,

> the undifferentiated stems were real forms in themselves and could be used without additional suffixes or grammatical endings. However, when so used, a vowel had to be added to the stem: (A) **CV*- > **CV* (no change), (B) **CVC*- > **CVC*+V, (C) **CVC*+*C*- > **CVC*+*C*+V, or (D) (reduplicated) **CVC*-*CVC*- > **CVC*-*CVC*+V. Following Afrasian terminology, this vowel may be called a "terminal vowel" (TV). Not only did terminal vowels exist in Proto-Afrasian (cf. Ehret 1995:15; Bender 2000:214—215 and 2007:737—739; Hayward 1987; Mous 2012:364), they are also found in Dravidian, where they are called "enunciative vowels" (cf. Steever 1998a:15; W. Bright 1975; Krishnamurti 2003:90—91; Zvelebil 1990:8—9), and in Elamite (cf. Khačikjan 1998:11; Grillot-Susini 1987:12; Stolper 2004:73), where they are called "thematic vowels". In Proto-Dravidian, the enunciative vowel was only required in stems ending in obstruents, which could not occur in final position.

Concerning enunciative vowels in Dravidian, Zvelebil (1990:8—9) notes:

> No obstruents can occur finally. When they do, they are followed by a "non-morphemic" automatic (so-called epenthetic, or 'enunciative' or 'euphonic', i.e. predictable morphophonemic) vowel *-ə which is regularly dropped according to morphophonemic rules…

While Krishnamurti (2003:90—91) writes:

> If the stem ends in a stop, it is followed by a non-morphemic or enunciative vowel /u/. Roots of (C)VC- and (C)VCC- contrast when followed by formatives or derivative suffixes beginning with vowels. It is not clear if the difference between root-final C and CC is determined by the nature of the derivative suffix that follows. When roots in final obstruents are free forms, the final consonant is geminated followed by a non-morphemic (enunciative) *u*. When roots of the type (C)V̄C- or (C)VCC- are followed by a formative vowel, V_2 = /i u a/, they merge with (C)VC-.

Ehret (1995:15) makes the following observations about the terminal vowels in Proto-Afrasian:

> The Omotic, Cushitic, and Chadic evidence conjoin in requiring the existence in PAA of an additional element in word formation, a terminal vowel (TV) in nouns and modifiers, the original function and meaning of which remain obscure. TVs have been subjected to comparative-historical investigation in only two groups of Afroasiatic languages. In Omotic they have no reconstructible function beyond their necessary attachment to singular noun stems in semantically predictable fashion. With the exception of Kafa, in which two TVs, *-o* and *-e*, have been grammaticalized respectively as masculine and feminine markers, they carry no grammatical or recognizable semantic load (Hayward 1987). In proto-Southern Cushitic, pairs of TVs formed a variety of singular-plural markers. Particular paired sets tended to go with either masculine or feminine nouns, but an individual TV on a singular noun

> generally gave no indication of the grammatical gender of that noun (Ehret 1980:49—50).
>
> From these indicators it seems reasonable to conclude that TVs are fossils of a nominal morphology productive in pre-proto-Afroasiatic and predating the rise of grammatical gender in the family. Having lost their original grammatical function, they have been reanalyzed as markers of the singular or sometimes, as in the case of Southern Cushitic, of the plural in nominals. In the Boreafrasian subgroup (Semitic, Egyptian, and Berber: see Chapter 6 for this classification), the TVs have generally been dropped entirely, leaving most nouns and adjectives as consonant-final words.
>
> The existence of TVs at early stages of Afroasiatic evolution obviates the need to reconstruct any syllabic consonants for PAA. The usual word structure of nouns and adjectives would have been $*C_1(VC_2)(C_s)V_{tv}$, in which the only possible structures are CVC and CV and never just C. The presence of syllabic C in Boreafrasian languages can be understood as the natural outcome of vowel loss, whether word-internal or word-final, within that particular subgroup (as is also separately the case in a few modern Omotic languages, notably Bench and Maji, where the same kind of sound change has independently been at work).

While Bender (2000:214—215) makes the following comments about Omotic:

> Hayward (1987, 1980a, 1980b) reported in some detail on the matter of "terminal vowels" (TVs) found in sg. nouns in Ometo languages and Ari. Hayward states that the TVs in Ari are often independent of the root (1990b:440) and that in Zaysé, they are appendages, not part of the root, but being unpredictable, must be included in lexical entries (1990a:242). In some cases, final vowels distinguish gender. This is much more the case with pronominals, but I restrict the term "TVs" to the nominal category in non-derived and non-inflected form (except insofar as TV may mark gender)…
>
> In the 1990c article, variation of vowels beyond the "cardinal" *i*, *e*, *a*, *o*, *u* did not seem to be significant in TVs. TVs are prominent in all branches except Gimira, where CVC is the norm, with tone carrying a high functional load. It would be tidy if TVs were reconstructable: they would thus be predictable across languages if not within languages according to lexical items. But first of all, there is no unanimity among the sources: different investigations record different TVs and even one source may have alternative forms.

As noted above, terminal vowels are only used with nouns and modifiers in Afrasian, while in Dravidian, the single reconstructible terminal vowel, *-*u*, is used after any free-form stem ending in an obstruent. For Proto-Nostratic, the patterning may be assumed to have been as follows: If an undifferentiated nominal or verbal stem was used as a free-form, a terminal vowel had to be added. In Proto-Nostratic, the terminal vowels were: **a*, **i*, and **u*. The origin of terminal vowels will be investigated below.

The original root structure patterning was maintained longer in Afrasian, Dravidian, and Altaic than in the other branches, while the patterning found in Proto-Indo-European and Proto-Kartvelian has been modified by developments

specific to each of these branches. The root structure constraints found in Proto-Indo-European were an innovation. In Proto-Uralic, the rule requiring that all words end in a vowel (cf. Décsy 1990:54) was an innovation and arose from the incorporation of the so-called "terminal vowel" into the stem. It should be noted that reduplication was a widespread phenomenon in Proto-Nostratic. It was one of the means used to indicate plurality in nouns, while, in verbs, it may have been used in frequentive and habitual formations.

On the basis of the evidence of Proto-Indo-European, Proto-Kartvelian, Proto-Afrasian, Proto-Dravidian, and Proto-Altaic, it may be assumed that there were three fundamental stem types: (A) verbal stems, (B) nominal (and adjectival) stems, and (C) pronominal and indeclinable stems. Some stems were exclusively nominal. In the majority of cases, however, both verbal stems and nominal stems could be built from the same root. In Proto-Nostratic, only pronominal and indeclinable stems could end in a vowel. Verbal and nominal stems, on the other hand, had to end in a consonant, though, as noted above, when the undifferentiated stems were used as real words in themselves, a "terminal vowel" had to be added to the stem. As we shall see below, the "terminal vowels" were morphologically significant. Adjectives did not exist as an independent grammatical category in Proto-Nostratic.

As in Proto-Kartvelian, it appears that Proto-Afrasian underwent several syntactic shifts in its prehistoric development. Surely, the VSO pattern found in Semitic, Egyptian, and Berber is an innovation. While it is not possible to trace the exact developments, it seems likely that the original pattern was SOV, which is what is found in the majority of Cushitic languages. Ehret (1995:52) arrives at the same conclusion for Proto-Afrasian. He notes that nominalizing morphology in Proto-Afrasian was predominantly suffixal. One little aside: The more I look at the matter, the more I am convinced that, within Afrasian, Semitic is the most aberrant branch. In view of this, notions of what Proto-Afrasian might have been like, based primarily upon the Semitic model, are likely to be false.

17.5. PREHISTORY OF ROOT STRUCTURE PATTERNING AND THE DEVELOPMENT OF TERMINAL VOWELS

During the earliest period of Proto-Nostratic, *roots* could only have the forms: (a) **CV*- and (b) **CVC*-. Type (a) was restricted to pronominal stems and indeclinables, while type (b) characterized nominal and verbal stems. A single *derivational suffix* could be placed after root type (b): **CVC*+*C* (derivational suffix [DS]). Grammatical relationships were indicated by placing *particles* either after the undifferentiated stem or after the stem plus a derivational suffix: (a) **CVC* + *CV* (particle [P]) or (b) **CVC*+*C* (derivational suffix [DS]) + *CV* (particle [P]). In nominal stems, a morphologically significant *terminal vowel* (TV) had to be added directly after the root, while in verbal stems, a *formative vowel* (FV) had to be added between the root and any following element, be it derivational suffix or particle; thus, we get the following patterns:

(a) (noun stem) *$CVC(+C_{DS})+V_{TV}$ (plus particle): *$CVC(+C_{DS})+V_{TV}+CV_P$
(b) (verb stem) *$CVC+V_{FV}(+C_{DS})$ (plus particle): *$CVC+V_{FV}(+C_{DS})+CV_P$

The derivational suffixes were derivational rather than grammatical in that they either changed the grammatical category of a word or affected its meaning rather than its relation to other words in a sentence. Cf. Crystal 2008:138 and 243.

This is essentially the stage represented in Proto-Dravidian, though Proto-Dravidian has added long vowels to the equation as well as stems beginning with a vowel (no doubt arising from the loss of initial laryngeals) (cf. Krishnamurti 2003:179—184 and 277—279). Next, the formative vowel was reinterpreted as part of the derivational suffix in verbal stems: *$CVC+VC+CV$. This is the stage represented by Proto-Afrasian (cf. Diakonoff 1988:85—110; Ehret 1995:15 and 27—34) and is the basis for the root structure patterning found in Proto-Kartvelian and Proto-Indo-European as well. From an Afrasian perspective, there is no such thing as "formative vowels" — they are only preserved in Dravidian and Elamite, though, in Elamite, their status is disputed (cf. Reiner 1969:78).

In Proto-Dravidian, the original meaning of the formative vowels was lost. According to Krishnamurti (2003:97), the formative vowels "apparently had an epenthetic role of splitting clusters without affecting the syllable weight …" Note the following examples given by Krishnamurti (2003:181):

1. *_tir-a-y-_ (*_-p-_/*_-mp-_, *_-nt-_) 'to roll (intr.)'; *_tir-a-y-_ (*_-pp-_/*_-mpp-_, *_-ntt-_) 'to roll up (tr.)', (n.) *_tir-a-y_ 'wave, screen, curtain'; *_tir-a-nku_ 'to be curled up (intr.)', *_tir-a-nkku_ 'to shrivel (tr.)';
2. *_tir-a-ḷ-_ (*_-p-_, *_-ṇṭ-_) 'to become round (intr.)', *_tir-a-ḷ-_ (*_-pp-_, *_-ṇṭṭ-_) 'to make round (tr.)';
3. *_tir-i-_ (*_-p-_, *_-nt-_) 'to turn (intr.)', *_tir-i-_ (*_-pp-_, *_-ntt-_) 'to turn (tr.)'; *_tir-u-ku_ 'to twist (intr.)', *_tir-u-kku_ 'to twist (tr.)'; *_tir-u-mpu_ 'to twist, to turn (intr.)', *_tir-u-mppu_ 'to twist, to turn (tr.)';
4. *_tir-u-ntu_ 'to be corrected, to be repaired (intr.)', *_tir-u-nttu_ 'to correct, to rectify (tr.)'.

As stated by Krishnamurti (2003:181), "[t]he Proto-Dravidian root is obviously *_tir-_, meaning 'turn, roll, twist, change shape' → 'correct', etc. The formatives occur in two layers. The first layer is V = _i_, _a_, _u_; and the second layer, either a sonorant (L) as in _y_, _ḷ_; or a simple or geminated stop ± homorganic nasal: P as in *_ku_; PP as in *_kku_; NP as in *_nku_, *_ntu_, *_mpu_; NPP as in *_nkku_, *_nttu_, *_mppu_."

In Elamite, verbal stems consisted either of a root ending in a vowel or of a root extended by a thematic vowel if the root ended in a consonant: _kuk-i_ 'to protect' (< _kuk-_) (cf. Khačikjan 1998:13). Khačikjan (1998:11) also notes:

> Elamite was an agglutinative suffixal language. The suffixes joined either the root or the stem.
>
> The root morpheme consisted mostly of two consonants and one or two vowels: _nap_ 'deity', _ruh_ 'man', _zana_ 'lady', _kap_ 'treasure', _kik_ 'sky', etc.

> The stem consisted of a root ending in a consonant, with thematic vowels *-i*, *-u*, *-a*, cf. *per-i-*, *mur-u-*, *tahh-a-* (< *tah-*). The thematic vowels *-u* and *-a* were only attested with verbal stems, whereas *-i* with nominal and nomino-verbal ones: *tir-i-* 'to speak', *kukk-i* 'vault, roof', *peti-* 'enemy; to revolt'.

Reiner (1969:78) notes, likewise, that the Elamite verb base always ended in a vowel: CVCV, CVCCV, and, though more rarely than the first two types, CV. Reiner argues against treating the thematic vowel ("stem-vowel") as a separate morpheme. Khačikjan, however, follows Paper in considering the thematic vowel to be a separate morpheme. Grillot-Susini (1987:32) simply states: "The structure of the verb is analogous to that of the noun. It consists of a base (simple root or enlarged by *-i*/*u*/*a*) to which the inflections of the verbal conjugation, the participial formants, and/or the nominal person suffixes are attached."

Now, it is curious that the formative vowel can take different shapes in Proto-Dravidian: **a*, **i*, or **u*. This seems to indicate that the different formative vowels must have had some sort of morphological significance at an earlier point in time, though this distinction was lost in Proto-Dravidian proper. Not only must the formative vowels have had morphological significance, the terminal vowels must also have had morphological significance.

The formative vowels found in verbal stems may have been aspect markers, as Zaborski has tried to show for Omotic (cited in Bender 2000:217). Here, according to Zaborski, the patterning was as follows: *a* marks present (imperfective), *i* ~ *e* mark past (perfective), and *u* ~ *o* mark subordinate. Though originally supportive of Zaborski's views, Bender later became skeptical, pointing out that he finds the consonantal markers to be more significant. Indeed, for Omotic or even Afrasian, this is what we would expect. But Zaborski's views are not so easily dismissed. What he may have uncovered is a more archaic pattern, as Bender himself admits. In Finno-Ugrian, the ending **-i-* shows up as a past tense marker (cf. Collinder 1960:305—307 and 1965:132—134; Décsy 1990:76). Likewise in Dravidian, where the suffix **-i-* is one of several used to mark past tense (cf. Krishnamurti 2003:296—298). These may ultimately be derived from a perfective marker **-i-*.

As noted above, when the unextended root (**CVC*-) served as the verbal stem, the formative vowel (aspect marker) was added directly to the root: **CVC*+V_{FV}.

For nominal stems, the situation is a bit more complicated. Diakonoff (1988:59—61) reconstructs two "abstract" case forms for Proto-Afrasian: (a) **-i*/**-u* and (b) **-Ø*/**-a*. Diakonoff notes that the best preserved case marker was **-i*. It served two functions: (a) nominative-ergative and (b) genitive (in the sense 'belonging to'). In Cushitic, it often has two variants: (a) a short one in *-i* and (b) an "expanded" one in *-iya* or *-ii*. Given the identical form of the nominative-ergative and genitive, Diakonoff assumes that the nominative-ergative function arose from the genitive function. For **-Ø*/**-a*, Diakonoff assumes that it represented "the noun outside of grammatical links (the so-called '*status indeterminatus*') or the noun-predicate (the so-called '*status praedicativus*'), but also the subject of a state or condition, including the subject of the state that resulted from the action." Finally, it should be noted that Sasse (1984:117) reconstructs the following two declensional

paradigms for nouns with short final vowels for Proto-East Cushitic (see also Appleyard 1996:7 — for Omotic parallels, cf. Zaborski 1990):

	Masculine	Feminine
Absolute Case	*-*a*	*-*a*
Subject Case	*-*u/i*	*-*a*

Sasse (1984) discusses the development of this system within Cushitic and ends by noting that traces of the above patterning can also be found in Semitic and Berber (Proto-Semitic nominative *-*u*, accusative *-*a*, genitive *-*i* [cf. Hasselbach 2013]).

I assume that the following patterning existed in early Proto-Nostratic:

1. *-*u* was used to mark the subject (the agent) in active constructions — these subjects "perform, effect, instigate, and control events" (Mithun 1991:538);
2. *-*i* indicated possession;
3. *-*a* was used to mark:

   (a) The direct object (the patient) of transitive verbs;
   (b) The subject ("non-agent subject" [= the patient]) in stative constructions — these subjects are "affected; things happen or have happened to them", just like direct objects (Mithun 1991:538);
   (c) The so-called "*status indeterminatus*".

In later Proto-Nostratic, this patterning became disrupted, though, as we have seen, it may have survived into Proto-Afrasian. In later Proto-Nostratic, the relational markers *-*ma* and *-*na* came to be used to mark the direct object of transitive verbs as well as the subject in stative constructions. Eventually, these relational markers became the primary means of marking the direct object of transitive verbs or the subject in stative constructions, with the result that the older patterning became disrupted. Thus, in the latest stage of the Nostratic parent language, we find the following patterning:

1. *-*u*: used to mark the subject in active constructions:

   (a) *CVC+*u*
   (b) *$CVC+C_{DS}$+*u*
   (c) *CVC-CVC+*u*

2. *-*a* ~ *-*ma*/*-*na*: used to mark the direct object of transitive verbs as well as the subject in stative constructions:

   (a) *CVC+*a* plus *-*ma*/*-*na*: *CVC+*a*+*ma/na*
   (b) *$CVC+C_{DS}$+*a* plus *-*ma*/*-*na*: *$CVC+C_{DS}$+*a*+*ma/na*
   (c) *CVC-CVC+*a* plus *-*ma*/*-*na*: *CVC-CVC+*a*+*ma/na*

*-*ma*/*-*na* was the first case form (bound relational marker) to develop in Proto-Nostratic. The second was the genitive (in the sense 'belonging to') in *-*nu*. Indeed, these are the only two bound relational markers that can be confidently reconstructed for the latest period of Proto-Nostratic (see below for more information). Finally, it seems likely that unextended *-*a* remained as the indicator of the *status indeterminatus*.

In Elamite, the *-*a* (and *-*u* ?) variant was eliminated in nominals. Dravidian, on the other hand, underwent further developments. Here, *-*i* ~ *-*a* were reinterpreted as oblique markers (on which, cf. Krishnamurti 2003:225—226), while *-*u* assumed the role of enunciative vowel (cf. Krishnamurti 2003:91: "[w]hen roots in final obstruents are free forms, the consonant is geminated followed by a non-morphemic [enunciative] *u*.)".

This, then, explains the origin of both the so-called "formative vowels" and "terminal vowels". It may be noted here that Ehret (1995:15) concludes that the terminal vowels found in Afrasian "are fossils of a nominal morphology productive in pre-proto-Afroasiatic and predating the rise of grammatical gender in the family. Having lost their original grammatical function, they have been reanalyzed as markers of singular or sometimes, as in the case of Southern Cushitic, of the plural in nominals." As a further note, the terminal vowel *-*a* may ultimately be the source of the highly productive thematic stems in later Proto-Indo-European.

Ehret does not reconstruct formative vowels for Proto-Afrasian. In this, he is correct. As noted above, in Proto-Afrasian, the earlier formative vowels have been reinterpreted as part of the derivational suffixes.

17.6. RULES OF PROTO-NOSTRATIC SYNTAX

Dolgopolsky (1984:92—93 and 2005) sets up the following rules of Proto-Nostratic syntax:

A. Words are classified into three groups (which differ in their syntactic behaviour):
   a) Full Words (in the sense of the Chinese traditional grammar, i.e. semantic counterparts of nouns, adjectives, adverbs and verbs of modern languages),
   b) Pronouns,
   c) Grammatical Words (i.e. case-markers).
B. Pronouns (if stressed) can behave syntactically according to the rules of Full Words as well.
C. The predicate is the last Full Word of the sentence.
D. Any object precedes its verb (i.e. its Full Word with verbal meaning).
E. Any attribute (expressed by a Full Word) precedes its *regens*.
F. A pronoun (personal or demonstrative) functioning as attribute follows its *regens*. In this case a personal pronoun has possessive meaning.
G. A pronoun functioning as subject follows its predicate.

H. Case-markers follow the corresponding Full Word. Some of these (genitive-marker **nu*, accusative-marker **ma*) follow immediately after its Full Word, while others (such as locative postpositions) can be used in a construction Full Word + **nu* + postposition. This accounts for *-*n*- preceding the case-ending in the oblique cases of the IE heteroclita, for the increment *-*in*-/-*n*- preceding the case endings of the oblique cases in D[ravidian], for some F[inno-] U[grian] case forms (locative *-*na* < **nu Ha*), as well as for the *-*n*-increment in the personal pronominal stems in the oblique cases (→ all cases) in U[ralic], T[urkic], T[ungusia]n, and D[ravidian]…

A logical corollary of rules C—E is that the subject (if it is a Full Word) occupied the remaining place: somewhere in the initial part of the sentence.

These rules have been preserved almost entirely (either as syntactic rules of word-order or as morpheme-order in grammatical forms) in Uralic, Turkic, Mongolian, Tungusian, Gilyak, Korean, Japanese, Dravidian, Early Indo-European, Cushitic, and have determined the order of morphemes within words in the rest of the Nostratic languages.

Proto-Nostratic syntax was head-final, or left-branching, that is, dependents preceded their heads according to the so-called "rectum-regens rule". In other words, "adverbs" preceded verbs, "adjectives" preceded nouns, and auxiliaries followed the main verb, though it must be emphasized here that adjectives did not exist as an independent grammatical category in Proto-Nostratic (see below for details). The unmarked syntactical order was Subject + Object + Verb (SOV).

From a typological perspective, the native American language Yuki of northern California (cf. Kroeber 1911) may be cited as an example of a language structurally similar to Proto-Nostratic. Hurrian (cf. Bush 1964; J. Friedrich 1969a; Laroche 1980; Speiser 1941; Wegner 1999 and 2007; Wilhelm 2004a) may be mentioned as another language that was structurally similar to Proto-Nostratic during the latest period of development, when bound morphemes had started to appear, though Proto-Nostratic had active alignment, while Hurrian had ergative alignment.

17.7. PRONOMINAL, DEICTIC, AND ANAPHORIC STEMS

17.7.1. FIRST PERSON STEMS

First person singular (active): **mi*
First person plural (inclusive, active): **ma*
First person (stative): **kʰa*
First person (stative): **ħa*
First person singular: **na*
First person plural (exclusive, active): **na*
First person (postnominal possessive/preverbal agentive): **ʔiya*

17.7.2. SECOND PERSON STEMS

Second person: *t^hi, (oblique) *t^ha
Second person: **si*
Second person: **ni*

17.7.3. ANAPHORIC AND DEICTIC STEMS

Pronominal base of unclear deictic function: **-gi* (~**-ge*)
Deictic particle: (A) *$ʔa$- (~ *$ʔə$-) (distant), (B) *$ʔi$- (~ *$ʔe$-) (proximate), and (C) *$ʔu$- (~ *$ʔo$-) (intermediate)
Deictic particle: (A) *k^ha- (~ *$k^hə$-) (proximate), (B) *k^hu- (~ *k^ho-) (distant), and (C) *k^hi- (~ *k^he-) (intermediate)
Deictic particle: (A) *t^ha- (~ *$t^hə$-) (proximate), (B) *t^hu- (~ *t^ho-) (distant), and (C) *t^hi- (~ *t^he-) (intermediate)
Deictic particle: **ša*- (~ **šə*-)
Anaphoric pronoun stem: **si*- (~ **se*-)
Anaphoric pronoun stem: **na*-, **ni*-
Deictic particle: *t^yha- ‘that over there, that yonder (not very far)’

Note: The deictic particles (A) *$ʔa$- (~ *$ʔə$-) (distant), (B) *$ʔi$- (~ *$ʔe$-) (proximate), and (C) *$ʔu$- (~ *$ʔo$-) (intermediate) often combined with other deictic stems, as follows:

1. *$ʔa$+*na*-, *$ʔi$+*na*-, *$ʔu$+*na*-;
2. *$ʔa$+k^ha-, *$ʔi$+k^ha-, *$ʔu$+k^ha-;
3. *$ʔa$+t^ha-, *$ʔi$+t^ha-, *$ʔu$+t^ha-;
4. *$ʔa$+*ša*-, *$ʔi$+*ša*-, *$ʔu$+*ša*-.

17.7.4. INTERROGATIVE, RELATIVE, AND INDEFINITE STEMS

Relative: *$k^{wh}i$- (~ *$k^{wh}e$-); interrogative: *$k^{wh}a$- (~ *$k^{wh}ə$-)
Interrogative-relative stem: *$ʔay$-, *$ʔya$-
Interrogative: **mi*-; relative: **ma*-
Interrogative-relative: **na*
Indefinite: **ma*-, **mi*-, **mu*-
Indefinite: *d^yi- (~ *d^ye-) ‘this one, that one’

17.7.5. SUMMARY

The following two tables correlate the reconstructions for the Proto-Nostratic first and second person personal pronoun stems proposed in this book (column A) with those proposed by Illič-Svityč (1971—1984; also V. Dybo 2004) (column B), Dolgopolsky (1984, 2005, and 2008) (column C), Greenberg (2000) (column D), and Kortlandt (2010b/d/e) (column E):

A. First person personal pronouns:

	A	B	C	D	E
1st pers. sg. (active)	**mi*	**mi*	**mi*	**m*	**mi*
1st pers. pl. (incl., active)	**ma*	**mä*		**m*	**me*
1st pers. (stative)	**k^ha*			**k*	
1st pers. (stative)	**ħa*				
1st pers. sg.	**na*	**naHe-na*, **na*		**n*	
1st pers. pl. (excl., active)	**na*		**n̄ó*	**n*	
1st pers. (postnominal)	**ʔiya*		**HoyV*		

B. Second person personal pronouns:

	A	B	C	D	E
2nd pers.	**t^hi*, **t^ha*	**ṭʌ-na*, **ṭa*	**ṭ[ü]* (> **ṭi*)	**t*	**te*
2nd pers.	**si*	**si-* possessive	**ś[ü]* (> **śi*)	**s*	
2nd pers.	**ni*			**n*	

This table correlates the reconstructions for the Proto-Nostratic anaphoric, deictic, interrogative, relative, and indefinite stems proposed in this book (A) with those proposed by Illič-Svityč (B), Dolgopolsky (C), Greenberg (D), and Kortlandt (E):

	A	B	C	D	E
Deictic particle	**-gi* (~ **-ge*)			**ge*	
Deictic particle	**ʔa-* (~ **ʔə-*), **ʔi-* (~ **ʔe-*), **ʔu-* (~ **ʔo-*)	**ʔa*, **ʔi*/**ʔe*	**ha*, **[h]e*, **[h]i*, **[h]u*	**i* ~ **e*, **a* ~ **e*	**i*/**e*
Deictic particle	**k^ha-* (~ **k^hə-*), **k^hu-* (~ **k^ho-*), **k^hi-* (~ **k^he-*)		**Ḳ[ü]*	**ku*	
Deictic particle	**t^ha-* (~ **t^hə-*), **t^hu-* (~ **t^ho-*), **t^hi-* (~ **t^he-*)	**ṭa*	**ṭä*	**t*	**t*
Deictic particle	**ša-* (~ **šə-*)			**s*	**s*
Anaphoric stem	**si-* (~ **se-*)	**šä*	**sE*		
Anaphoric stem	**na-*, **ni-*		**nE* (dual)		
Deictic particle	**t^{yh}a-*		**ćE*		
Relative	**k^{wh}i-* (~ **k^{wh}e-*)				

	A	B	C	D	E
Interrogative	*$k^{wh}a$- (~ *$k^{wh}ə$-)	*$ḳo$	*$Ḳo$	*k	*k
Interrogative -relative	*$ʔay$-, *$ʔya$-	*ja	*ya	*j	
Interrogative	*mi-	*mi	*mi	*m	
Relative	*ma-				
Interrogative -relative	*na-	*na		*n	
Indefinite	*ma-, *mi-, *mu-	*mu			
Indefinite	*d^yi- (~ *d^ye-)				

17.8. NOMINAL MORPHOLOGY

17.8.1. INTRODUCTION

The overall structure of nominals (nouns and "adjectives") was as follows:

Root (+ derivational suffix) + terminal vowel (*a, *i, *u)
(+ relational marker) (+ number marker)

A stem could consist of the unextended root (*CVC-) or the root extended by a single derivational suffix (*CVC+C-). As noted above, it is necessary to recognize two distinct periods of development in Proto-Nostratic. In the earliest phase of development, the relational markers listed below were free relational morphemes (postpositional particles). In later Proto-Nostratic, however, at least two of them were well on their way to becoming bound relational morphemes (case suffixes).

As just stated, only the following two bound relational markers (case suffixes) can be confidently reconstructed for the latest period of Proto-Nostratic: (a) direct object *-*ma*, *-*na* and (b) genitive *-*nu*. Other case relationships were expressed by postpositions (see below for a list), some of which developed into bound case morphemes in the individual daughter languages. This is confirmed by Dravidian, where only the accusative (*-*ay*, *-*Vn*), dative (*-*kk*-/*-*k*-), and genitive (*-*a*, *-*in* [< *-*i* + *-*nu*]) can be confidently reconstructed for the Dravidian parent language (cf. Krishnamurti 2003:227; Steever 1998a:20 [Steever adds nominative *-*Ø*]). Other case forms developed in the Dravidian daughter languages (for discussion, cf. Krishnamurti 2003:227—243). Likewise, only the following two grammatical cases can be reconstructed for Proto-Uralic (cf. Abondolo 1998a:18; Raun 1988:558—559): (a) accusative *-*m*, which probably was used to mark the definite direct object of finite verbs, and (b) a subordinate suffix *-*n*, which functioned as a genitive/nominalizer with nouns and as an adverb formant with verbs. Abondolo (1998a:18) further points out that there were also at least three local cases in Proto-Uralic: (a) locative *-*nA*, (b) separative *-*tA* ~ *-*tI*, and (c) and perhaps the latives *-*k* (and/or *-*ŋ*) and *-t^y (traditional *-*ć*) (and/or *-n^y [traditional *-*ń*]). Sinor (1988:714—725) devotes considerable attention to the question of common case markers between

Uralic and Altaic. He, too, posits a Proto-Uralic accusative in *-*m* and a genitive in *-*n*. For the former, he notes that nothing comparable can be posited for Proto-Turkic or Proto-Mongolian, but he does reconstruct a Proto-Tungus accusative *-*m*, which is in agreement with what is found in Uralic. The clearest parallels for the latter are to be found in the Proto-Mongolian genitive *-*n* (cf. Poppe 1955:187—194) and in the Proto-Turkic genitive *-*n* (cf. Róna-Tas 1998:73). Poppe (1955: 187—194) mentions that the genitive and accusative have converged in some Mongolian languages. This seems to indicate that Proto-Mongolian may have preserved the *-*n* variant accusative form as opposed to the *-*m* variant found in Uralic and Tungus. Sinor (1988:715—725) also discusses the Uralic and Altaic parallels between various local cases. Finally, it is worth mentioning here that, within Afrasian, Zaborski (1990:628) tentatively reconstructs the following case morphemes for Proto-Omotic: (a) nominative *-*i*, (b) genitive-instrumental-directional *-*kV*, (c) dative *-*s*, (d) dative-comitative *-*rV*, (e) accusative *-*a* and *-*nV*, (f) instrumental-locative-directional-dative *-*nV*, and (g) ablative *-*pV*. Zaborski (1990:618) notes that some of these case forms may go back to earlier postpositions. Parallels with Cushitic show that at least some of these case forms go back to Proto-Afrasian. Diakonoff (1988:61) notes that the following cases can be established for Proto-Afrasian with reasonable certainty: (a) *-*Vš*, *-*šV* locative-terminative; (b) *-*dV*, *-*Vd* comitative, dative; (c) *-*kV* ablative and comparative; (d) *-*Vm* locative-adverbialis; (e) *-*l* directive; and (f) *-*p* (also *-*f*) ablative (in Omotic — conjunction, demonstrative pronoun in other languages). The ultimate Nostratic origin of several of the case forms posited by Zaborski for Proto-Omotic and by Diakonoff for Proto-Afrasian is completely transparent.

In Proto-Nostratic, adjectives did not exist as a separate grammatical category. They were differentiated from nouns mainly by syntactical means — a noun placed before another noun functioned as an attribute to the latter. Moreover, they did not agree with the head noun in number or gender. Caldwell (1913:308—318) describes similar patterning for Dravidian: "…adjectives have neither number, gender, nor case, but are mere nouns of relation or quality, which are prefixed without alternation to substantive nouns". Krishnamurti (2003:389) points out, however, that not all Dravidian adjectives are of the derived types described by Caldwell. Krishnamurti considers adjectives to form a separate part of speech in Dravidian, as does Zvelebil (1977:59—69 and 1990:27—28), though Zvelebil mentions the fact that primary, underived adjective stems are statistically very rare in the Dravidian daughter languages. According to Steever (1998a:19): "The reconstruction of further parts of speech such as adjectives and adverbs to the proto-language is controversial. While some scholars have projected the category of adjectives to Proto-Dravidian, many of the candidates for adjectival status appear to be defective nouns or verbs. Although the scholarly literature speaks of certain forms as having adjectival function, viz., modifying a nominal, conclusive evidence that those forms constitute a formally distinct class is largely lacking. Further, none of the putative adjectives in Dravidian exhibits a comparative or superlative degree. These degrees are expressed instead by syntactic means…" (see also Andronov 2003:180 and 300). As for Elamite, Khačikjan (1998:17) notes: "There was no

special class of adjectives in Elamite. The mechanism of forming adjectives was the same as that used to express attributive relationships." According to Diakonoff (1988:57), adjectives did not form a separate grammatical category in Proto-Afrasian, and this appears to have been the situation in Proto-Berber (cf. Kossmann 2012:34) and probably Proto-Cushitic (cf. Mous 2012:359) as well. Likewise in Proto-Uralic (cf. Abondolo 1998a:18): "Nouns were probably not morphologically distinct from adjectives in proto-Uralic, although the distribution of the comparative suffix *=mpV suggests that an adjective category may have been developing before the breakup of Finno-Ugric". In later Proto-Indo-European, on the other hand, adjectives formed a distinct grammatical category, and they agreed with the head noun in number and gender (for details and examples, cf. Szemerényi 1996:192—202; Beekes 1995:196—200 and 2011:219—223; Fortson 2010:134—136; Meillet 1964:408—409; Meier-Brügger 2003:218—223). Adjectives also form a separate part of speech in the Kartvelian languages. In Turkic, adjectives are not usually clearly distinguished from nouns morphologically. However, several suffixes are used primarily to form adjectives. In Modern Mongolian, there is no difference between adjectives and nouns. A noun placed before another noun functions as an attribute to the latter (cf. Grønbech—Krueger 1993:18). In Gilyak / Nivkh, adjectives do not exist as a distinct word-class, the semantic function of adjectives being performed by qualitative verbs (cf. Gruzdeva 1998:16).

17.8.2. RELATIONAL MARKERS

Direct object: *-*ma*
Direct object: *-*na*
Possessive: *-*nu* 'belonging to'
Possessive: *-*lV* 'belonging to'
Dative: *-*na* 'to, for'
Directive: *-*k^ha* 'direction to or towards, motion to or towards'
Directive(-locative): *-*ri* 'direction to or towards, motion to or towards' (?)
Locative: *-*ni* 'the place in, on, or at which something exists or occurs'
Locative, instrumental-comitative: *-*ma* 'in, from, with'
Locative: *-*bi* 'in addition to, together with'
Locative: *-*i* 'near to, near by' (?)
Comitative-locative: *-*da* 'together with'
Oblique: *-*t^ha*

The following table correlates the reconstructions for the Proto-Nostratic relational markers proposed in this book (A) with those proposed by Illič-Svityč (B), Dolgopolsky (C), Greenberg (D), and Kortlandt (E):

	A	B	C	D	E
Direct object	*-*ma*	*-*mʌ*	*-*mA*	*-*m*	*-*m*
Direct object	*-*na*				
Possessive	*-*nu*	*-*n*	*-*nu*	*-*n*	*-*n*

	A	B	C	D	E
Possessive	*-*lV*			*-*l*	
Dative	*-*na*				*-*nV*
Directive	*-*k*^{h}*a*	*-*ḳ*ʌ	*-*ḴV* [= *-*ḳV* ?]	*-*ka* Dative	*-*ka* Dative
Directive(-locative)	*-*ri*			*-*ru*	*-*rV*
Locative	*-*ni*	*-*na*		*-*n*	*-*nV*
Locative, instr.-comit.	*-*ma*			*-*m*	
Locative	*-*bi*			*-*bh-*	
Locative	*-*i*			*-*i*	
Comitative-locative	*-*da*	*-*da* Loc.	*-*d[E]H*$_{1}$*a*	*-*ta* Locative	*-*du*, *-*da* (Altaic)
Oblique	*-*t*^{h}*a*	*-*tʌ* Instr.		*-*ta* Ablative	*-*t* Ablative

17.8.3. DUAL AND PLURAL MARKERS

Dual: **k^{h}i(-nV)*
Plural: **-t^{h}a*
Plural: **-ri*
Plural: **-k^{h}u*
Plural: **-s^{y}a*
Plural/collective: **-la*
Plural: **-nV*

The following table correlates the reconstructions for the Proto-Nostratic dual and plural markers proposed in this book (A) with proposed by Illič-Svityč (B), Dolgopolsky (C), Greenberg (D), and Kortlandt (E):

	A	B	C	D	E
Dual	*k^{h}i(-nV)		*-q̇V	*ki[n]	*-ki
Plural	*-t^{h}a	*-t	*-tV	*-t	*-t
Plural	*-ri		*-r[i]	*-ri	
Plural	*-k^{h}u		*-kU	*-ku	
Plural	*-s^{y}a			*-s	
Plural/collective	*-la	*-lA	*-ḽA	*-l	
Plural	*-nV	*-nA	*-n[ä]	*-n	

17.8.4. DERIVATIONAL SUFFIXES

Nominalizer: **-r-*
Nominalizer: **-m-*
Nominalizer: **-y-*
Nominalizer: **-t^{h}-*

Nominalizer: *-*n*-
Nominalizer: *-*l*-
Nominalizer: *-*k*^{h}-
Nominalizer: *-*k'*-

Note: No doubt, there were additional derivational suffixes in Proto-Nostratic. Indeed, it appears that any consonant could serve as a derivational suffix. Ehret (1995:15—54) lists and discusses a great variety of nominal and verbal extensions in Afrasian, while Starostin—Dybo—Mudrak (2003:173—220) do the same for Altaic (see Chapter 18 for details). For a comprehensive, though dated, treatment of Indo-European derivational morphology, cf. Brugmann—Delbrück 1897—1916, vol. II/1, and Brugmann 1904:281—354, and for Uralic, cf. Collinder 1960:255—281 and Décsy 1990:58—66.

17.8.5. NOUN MORPHOLOGY IN THE DAUGHTER LANGUAGES

In an important study, Leonid Kulikov (2009) discusses the various ways in which new cases can arise; specifically, he lists five main mechanisms (2009:439):

> New cases may arise (i) by adding adverbs, postpositions, and (rarely) prepositions (see section 28.1.1); (ii) by adding existing case markers to other case forms, which results in 'multilayer' case marking (see 28.1.2); (iii) from demonstrative pronouns or articles (see 28.1.4). New case forms may also go back to (iv) denominal adjectives and adverbials incorporated into the case paradigm (see 28.1.3). An important mechanism of the rise of new case(s) is (v) splitting of one case into two by borrowing of a new case marker from a different declension type (see 28.1.5).

These were the very mechanisms that were at work in the development of the case systems found in the various Nostratic daughter languages. Here, we may cite the paper entitled "Indo-European Nominal Inflection in Nostratic Perspective" (2014) by Václav Blažek, in which he shows that the same mechanisms were at work in the prehistoric development of the Proto-Indo-European case system (2014:35):

> Aharon Dolgopolsky (2005: 35) used to wonder if the original grammatical structure of Nostratic was synthetic or analytic. The present analysis of the Indo-European nominal inflection in Nostratic context confirms his preference of the analytic structure, with regard to the fact that most of the Indo-European case endings are derivable from various deictic or adverbial particles, some on the Indo-European level (usually with Nostratic roots), e.g. loc. sg. in *-*en*- (Skt. *udán*) vs. *H_1*en*- "in", others on the Nostratic level at least, e.g. loc. pl. in *-*su* vs. Kartvelian **šuwa*- "in the middle" or Central Cushitic **šəw*- "heart" (Dolgopolsky 2005: 17—19).

As far back as 1958, Winfred P. Lehmann had proposed a similar model regarding the early development of the Proto-Indo-European case system.

Janhunen (1982:30) reconstructs the following case endings for Proto-Uralic (cf. also Austerlitz 1968:1378—1379; Collinder 1960:282—297 and 1965:54—57; Hajdú 1972:41; Abondolo 1998a:18; Décsy 1990:68—72; Raun 1988:558—560; Cavoto 1998:26; Aikio to appear, p. 25; Marcantonio 2002:206; John C. Kerns [in Bomhard—Kerns] 1994:172—173, §3.5.3):

		Singular	Plural
Grammatical Cases	Absolutive (Nominative)	*-*Ø*	*-*t*
	Genitive	*-*n*	*-*j*
	Accusative	*-*m*	
Local Cases	Locative	*-*nå*/-*nä*	
	Ablative	*-*tə*	
	Dative	(?) *-*kə*, *-*ŋ*	

According to Abondolo (1998a:18), there were at least two grammatical cases in Proto-Uralic: an accusative *-*m* and a subordinate suffix *-*n*, which functioned as a genitive/pronominalizer. There were at least three local cases: a locative *-*nA*, a separative *$tA \sim *tI$, and perhaps the latives *-*k* (and/or *-*ŋ*) and *-t^y (and/or *n^y). See Nichols 1973 for a discussion of suffix ordering in Proto-Uralic.

In an important study in which he argues forcefully and persuasively for a genetic relationship between Uralic and Yukaghir, Merlijn De Smit (2017, §2.8 and §5) tentatively reconstructs the following case endings for Proto-Uralo-Yukaghir — he does not reconstruct plural endings:

	Singular	Plural
Nominative	*-*Ø*	(?)
Genitive	*-*n*	
Locative 1 (“Proximal”)	*-*me*	
Locative 2 (“Distal”)	*-*na*	
Ablative	*-*ta*	
Lative	*-*ka*	

At this point, it is interesting to compare the case endings (properly, tightly bound postpositions) reconstructed for Proto-Dravidian by Zvelebil (1977:33) (see also Krishnamurti 2003:217—243; Steever 1998a:20—21; Caldwell 1913:252—308 — Caldwell also notes parallels with Uralic):

Nominative	*-*Ø* and, possibly, *-*m*/*-*n* with non-personal substantives
Accusative	*-*(V)n*
Genitive	*-*in* (adnominal); *-*atu* (pronominal); *-*ă̄* (possessive)
Dative	*-*(k)ku*
Instrumental	*-*ān*/**āl*

Ablative	*-*in* (?)
Locative	*-*uḷ*; *-*in*/*-*il* (?); *-*kaṇ*
Sociative (Comitative)	*-*ŏ̌ṭu* or *-*(t)*-*ŏ̌ṭu* < *t*ŏ̌ṛV* (?)

This system can be derived from an earlier, simpler system, as is shown by comparison with Elamite (cf. McAlpin 1981:108—112). Clearly, several of the endings must have had a common origin (such as the genitive ending *-*in*, the ablative *-*in*, and the locative *-*in*[/*-*il*]). McAlpin (1981:111) reconstructs the following case endings for Proto-Elamo-Dravidian:

Nominative	*-*Ø*
Accusative	*-*(V)n*
Adessive/ Purposive (Dative)	*-*əkkə* (?)
Genitives:	
1. Possessive	*-*a*
2. Adnominal	*-*in*
3. Oblique/Locative	*-*tə*

McAlpin (1981:109) notes:

> The so-called cases in both Elamite and Dravidian are merely tightly bound postpositions with no immediately available lexical source.

According to Ramstedt (1952—1957.I:25—27), Greenberg (2000:133—135), and Poppe (1955:187—191), a genitive in *-*n* also existed in Proto-Altaic. This ending is still found in several Mongolian and Turkic languages, though the Turkic forms vary between *-n* and *-ŋ*. However, Sinor (1988:715) cautions that it is premature to assume a Common Altaic genitive in *-*n*, though "… there can be little or no doubt concerning the identity of the *-n* genitive suffix actually attested in some Uralic, Turkic, Mongol, and Tunguz languages."

To fill out the picture, let us look at the case endings traditionally reconstructed for Late Proto-Indo-European, that is, for the stage of development immediately prior to the emergence of the non-Anatolian Indo-European daughter languages (cf. Adrados—Bernabé—Mendoza 1995—1998.II:45—94; Beekes 2011:185—217; Brugmann 1904:373—399; Clackson 2007:92—100; Fortson 2010:113—139; Fulk 2018:141—180; Hirt 1921—1927.3:33—81; Lundquist—Yates 2018:2083; Meier-Brügger 2003:195—199; Meillet 1964:292—300; Schmalstieg 1980:46—87; Sihler 1995:248—256; Schmitt-Brandt 1998:180—220; Shields 1982; Szemerényi 1996: 157—192; Watkins 1998:65—66) (the following table is a composite from multiple sources and aims to be as comprehensive as possible; some of the reconstructions are more certain than others):

Case	Singular	Plural	Dual
Nominative	*-*s*, *-*Ø*	*-*es*	} *-$H_1(e)$
Vocative	*-*Ø*	*-*es*	
Accusative	*-*m*/*-*m̥*	*-*m̥s*/-*ms* or *-*n̥s*/-*ns*	
Genitive	*-*es*/*-os*/*-*s*	*-*om*/*-*ōm*	*-*ows* (?), *-*oH_1s* (?)
Ablative	*-*es*/*-os*/*-*s*; *-*$\bar{e}t^h$*/*-*$\bar{o}t^h$* (< *-*e/o-$H_1(e)t^h$*)	*-*b^h(y)os*, *-*mos*	*-*b^hyō* (?), *-*mō* (?)
Dative	*-*ey*	*-*b^h(y)os*, *-*mos*	*-*b^hyō* (?), *-*mō* (?)
Locative	*-*i*, *-*Ø*	*-*su*/*-si*	*-*ow* (?)
Instrumental	*-*(e)H_1*	*-*$b^h$is*, *-*mis*	*-*b^hyō* (?), *-*mō* (?)

Missing from this table is the thematic nominative-accusative neuter singular ending *-*m* — this form is to be derived from the accusative singular ending. The *-*b^h*- and *-*m*- endings found in several of the concrete cases are usually considered to be late additions, and some have even questioned whether or not they should even be posited for the Indo-European parent language. They are not found in Hittite. No doubt, these endings were originally adverbs that were gradually incorporated into the case system, with some daughter languages choosing *-*b^h*- and others choosing *-*m*-. They should not be reconstructed as case endings at the Proto-Indo-European level. In like manner, the genitive plural probably arose from the accusative singular, while the genitive singular and nominative singular endings in *-*s* must have had a common origin — these endings later spread from the genitive singular to the ablative singular. The dual was a late addition, while the plural originally had a reduced set of endings compared to what was found in the singular — this is the picture that emerges when the Hittite and other Anatolian data are brought into consideration. We may note here that the Proto-Uralic ablative ending *-*ta* and the Proto-Elamo-Dravidian oblique/locative ending *-*tə* are most likely related to the Anatolian instrumental singular endings within Indo-European: Hittite -*it*, -*et*, (rare) -*ta*; Palaic -*az*; Luwian -*ati*; Lycian -*adi*, -*edi*; Lydian -*ad*.

In his book *Indo-European Prehistory*, John C. Kerns (1985:109—111) devotes considerable attention to describing an oblique-*n* marker, which he claims is a major component in Indo-European heteroclitic stems, and he elaborates upon his ideas in his treatment of Nostratic declension in Bomhard—Kerns (1994:173—179, §3.5.3.1). He notes that this oblique-*n* is the source of the -*n* found in the genitive, ablative, and instrumental case endings in Dravidian — it is also found in the genitive, dative-lative (palatalized before a front vowel), and locative case endings in Uralic. Kerns even finds traces of this oblique-*n* in Eskimo and Japanese. Thus, this is a widespread and ancient feature. Greenberg (2000:130) also discusses this ending (see also Cavoto 1998:26):

> There is an -*n* genitive in Eurasiatic that frequently serves as a marker of the oblique case along with more specific indicators of location, instrument, etc.

When this occurs it invariably precedes the specific indicator. In certain cases it has also spread to the nominative.

17.9. VERBAL MORPHOLOGY

17.9.1. INTRODUCTION

In Proto-Nostratic, verbs fell into two types of construction: (1) active and (2) stative. In active constructions, which usually involved transitive verbs, the grammatical subject of the verb represented the agent performing the action, and the direct object represented the patient, or recipient, of the action (cf. Trask 1993:5). Stative constructions, on the other hand, expressed a state of affairs, rather than an event (cf. Trask 1993:259). Verbs expressed aspectual contrasts rather than temporal contrasts. Tense relates the time of the situation referred to to some other time, usually to the moment of speaking (cf. Comrie 1976:1—2), while aspect marks the duration or type of temporal activity denoted by the verb (cf. Crystal 1992:29; Comrie 1976:3). Proto-Nostratic had two aspects: (a) perfective (past) and (b) imperfective (non-past). Here, we may note that Diakonoff (1988:85) posits two aspects for the earliest form of Proto-Afrasian: (a) punctive (instantaneous) and (b) durative (protracted, or continuous). He assumes that these later developed into perfective and imperfective aspects and then, eventually, in the individual Afrasian daughter languages, into past and present-future tenses. He does not posit tenses for the Afrasian parent language. Proto-Nostratic had, at the very least, the following moods: (a) indicative; (b) imperative; (c) conditional; (d) inchoative; (e) hortatory-precative; and (f) prohibitive. In addition to a causative marker *-*sV*, there may also have been other valency-changing markers.

The overall structure of verbs was as follows:

Root + formative vowel (*a, *i, *u) (+ derivational suffix)
(+ mood marker) (+ person marker) (+ number marker)

A stem could consist of the unextended root or the root extended by a single derivational suffix (preceded, as indicated above, by a formative vowel). The position of the number marker seems to have been flexible — it could also be placed before the person marker. Gender was not marked. There were no prefixes in Proto-Nostratic. We may note here that Krishnamurti (2003:279 and 312) posits the following structure for verbs in Proto-Dravidian:

Stem + tense-mood + (gender-)number-person marker

Paper (1955:44) analyzes the Royal Achaemenid Elamite verb structure as follows:

1	2	3	4	5
Verb base +	stem vowel +	tempus +	person +	mode

Stative verbs were indifferent to number and, therefore, had no plural forms. They also had a special set of person markers different from those of active verbs:

	Active		Stative
Person	Singular	Plural	Singular only
1	*-*mi* *-*na*	*-*ma* (inclusive) (+ plural marker) *-*na* (exclusive) (+ plural marker)	*-*k^ha* *-*ħa*
2	*-*t^hi* *-*si* *-*ni*	*-*t^hi* (+ plural marker)	*-*t^hi*
3	*-*ša* (~ *-*šə*) *-*na*, *-*ni*	*-*ša* (~ *-*šə*) (+ plural marker) *-*na*, *-*ni* (+ plural marker)	*-*Ø*

Morphologically, verbs could be either finite or non-finite. Finite forms could be marked for aspect, mood, person, and number, but not for gender or tense. Non-finite forms exhibited nominal inflection. In unmarked word order, the verb occupied the end position of a clause (see above, §17.6. Rules of Proto-Nostratic Syntax).

17.9.2. NON-FINITE VERB FORMS

The following non-finite verb forms are widespread enough in the Nostratic daughter languages to guarantee their common origin, and, consequently, they are listed separately here. However, at the Proto-Nostratic level, they were indistinguishable from the nominalizing suffixes listed above.

Participle: *-*n*-
Participle: *-*t^h*-
Gerundive-participle: *-*l*-

The following table correlates the reconstructions for the Proto-Nostratic non-finite verb forms proposed in this book (A) with those proposed by Illič-Svityč (B), Dolgopolsky (C), Greenberg (D), and Kortlandt (E):

	A	B	C	D	E
Participle	*-*n*-		*$\bar{n}V$	*n	*n
Participle	*-*t^h*-		*$ṭV$	*t	*t
Gerundive-participle	*-*l*-			*l	*l

Note: Greenberg (2000:182—186, no. 44) also posits a participle in *-*nt*- for Proto-Eurasiatic on the basis of reflexes found in Indo-European, Finno-Ugrian, and Gilyak / Nivkh. However, this is best seen as a compound suffix: *-*n*- + *-*t^h*-.

17.9.3. FINITE VERB FORMS: MOOD MARKERS

Indicative: unmarked
Imperative: *-$k^h a$, *-$k^h i$, *-$k^h u$; *-*a*, *-*i*, *-*u* (< *-*ʔa*, *-*ʔi*, *-*ʔu*)
Conditional: *-*ba*
Hortatory-precative: *-*li*
Inchoative: *-*na*

Note: The bare stem could also serve as imperative, in which case the vowels *-*a*, *-*i*, or *-*u* were added to the stem. These were different than the formative vowels (aspect markers) previously discussed. Ultimately, they may go back to the deictic particles (A) *ʔ*a*- (~ *ʔə-) (distant), (B) *ʔ*i*- (~ *ʔ*e*-) (proximate), and (C) *ʔ*u*- (~ *ʔ*o*-) (intermediate).

The following table correlates the reconstructions for the Proto-Nostratic mood markers proposed in this book (A) with those proposed by Illič-Svityč (B), Dolgopolsky (C), Greenberg (D), and Kortlandt (E):

	A	B	C	D	E
Imperative	*-$k^h a$, *-$k^h i$, *-$k^h u$		*kV ~ *gV	*ka	
Conditional	*-*ba*			*p	
Hortatory-precative	*-*li*			*l	
Inchoative	*-*na*				

17.9.4. FINITE VERB FORMS: OTHERS

Causative: *-*sV*

The following table correlates the reconstruction for the Proto-Nostratic causative marker proposed in this book (A) with that proposed by Illič-Svityč (B), Dolgopolsky (C), Greenberg (D), and Kortlandt (E):

	A	B	C	D	E
Causative	*-*sV*			*s	

17.9.5. VERB MORPHOLOGY IN THE DAUGHTER LANGUAGES

Comparison of the various Nostratic daughter languages reveals many striking similarities in verb morphology. This comparison, for example, allows us to ascertain the ultimate origin of the athematic verb endings in Proto-Indo-European: they can be nothing other than possessive suffixes similar to what are found in Proto-Uralic and Proto-Altaic. Ultimately, these possessive suffixes had a pronominal origin. The earliest forms of the athematic endings in Proto-Indo-

European may have been as follows (cf. Bomhard 1988; see also Villar 1991:244—252; for details, cf. Chapters 19 and 20 of this book):

Person	Singular	Plural
1	*-*m*	*-*me*
2	*-*t^h*	*-*$t^h e$*
3	*-*s*, *-*Ø*	*-*en*

This earlier system may be partially preserved in Tocharian A, where the athematic endings are as follows:

Person	Singular	Plural
1	*-(ä)m*	*-mäs*
2	*-(ä)t*	*-c*
3	*-(ä)ṣ*	*-(i)ñc*

Note: There are phonological problems with the 3rd singular ending *-(ä)ṣ* in Tocharian — had this been inherited directly from Proto-Indo-European *-*si*, we would expect *-(ä)s*, not *-(ä)ṣ*. The best explanation is that of Pedersen, who derived this ending from an enclitic **se*-.

Traces of the earlier system are also found in the Anatolian languages. Note, for example, the Hittite 2nd singular active preterite ending *-ta*.

Now compare the following system of personal endings, which are assumed to have existed in Proto-Uralic (cf. Hajdú 1972:40 and 43—45; Cavoto 1998:127; Collinder 1965:134—135; Décsy 1990:66—68; Sinor 1988:725):

Person	Singular	Plural
1	*-*me*	*-*me* (+ Plural)
2	*-*te*	*-*te* (+ Plural)
3	*-*se*	*-*se* (+ Plural)

Traces of these endings are found in the Altaic languages as well. Sinor (1988:725) reconstructs the following possessive suffixes for Proto-Turkic and Proto-Tungus:

Proto-Turkic:

Person	Singular	Plural
1	*-*m*	*-*m* (+ Plural)
2	*-*ŋ*	*-*ŋ* (+ Plural)
3	*-*s*	**Ø*

Proto-Tungus:

Person	Singular	Plural
1	*-*m*	*-*m* (+ Plural) (excl.)
2	*-*t*	*-*t*
3	*-*n*	*-*t*

It may be noted here that Common Mongolian did not have special verbal endings to indicate person or number. However, at a later date, personal pronouns were added enclitically to the verbal forms (cf. Poppe 1955:251).

In an unpublished paper entitled "Cross-Bering Comparisons", Stefan Georg lists the following possessor suffixes in "Uralo-Eskimo", Samoyed, and Eskimo-Aleut (see also Seefloth 2000):

	Uralo-Eskimo		Samoyed		Eskimo-Aleut	
	Singular	Plural	Singular	Plural	Singular	Plural
1sg	*-m*	*-t-m*	*-mə*	*-t-mə*	*-m-(ka)*	*-t-m-(ka)*
2sg	*-t*	*-t-t*	*-tə*	*-t-tə*	*-n/t*	*-tə-n/t*
3sg	*-sa*	*-i-sa*	*-sa*	*-i-sa*	*-sa*	*-i-sa*
1pl	*-mə-t*	*-n/t-mə-t*	*-ma-t*	*-t/n-ma-t*	*-mə-t*	(= sg.)
2pl	*-tə-t*	*-t-mə-t*	*-ta-t*	*-t-ta-t*	*-tə-t*	(= sg.)
3pl	*-sa-t*	*-i-sa-t*	*-i-to-n*	*-to-n*	*-sa-t*	*-i-sa-t*

The personal endings survive in Elamite as well, especially in the 2nd and 3rd persons (by the way, the Elamite 1st singular ending, *-h*, is, of course, related to the 1st singular perfect ending *-*ḫ₂e* of traditional Proto-Indo-European, which is found, for example, in Luwian in the 1st singular preterite ending -*ḫa*, in Hittite in the 1st singular ending -*ḫi*, and in Greek in the 1st singular perfect ending -α; this ending may also be related to the Proto-Kartvelian 1st person personal prefix of the subject series, **xw*- [Gamkrelidze—Mačavariani 1982:85 reconstruct **w*- here, however], as suggested by Ivanov and Palmaitis) — compare, for example, the conjugation of *hutta*- 'to do, to make' from Middle Elamite (cf. Reiner 1969:76; Grillot-Susini 1987:33):

Person	Singular	Plural
1	*hutta-h*	*hutta-hu* (< *-h+h*)
2	*hutta-t*	*hutta-ht* (< *-h+t*)
3	*hutta-š*	*hutta-hš* (< *-h+š*)

Traces of the 2nd singular ending are also found in Dravidian — McAlpin (1981:120) reconstructs Proto-Elamo-Dravidian 2nd person ending *-*ti* (> Proto-Elamite *-*tə*, Proto-Dravidian *-*ti*). This is a significant archaism, since it bears no apparent resemblance to the common Elamo-Dravidian 2nd person personal

pronoun stem, which McAlpin (1981:114—115) reconstructs as **ni* and which may be an innovation (cf. Dolgopolsky 1984:87—88 and 100; Dolgopolsky posits Proto-Elamo-Dravidian **nün*, which he derives from **ṭün* through assimilation), though Greenberg (2000:76—77) discusses the possibility that there may have been a second person pronoun stem **nV* in Eurasiatic.

Traces of these endings are also found within Afrasian in Highland East Cushitic, where the suffixes of the simple perfect in Gedeo / Darasa, Hadiyya, Kambata, and Sidamo are as follows (cf. Hudson 1976:263—264):

Person	Gedeo / Darasa	Hadiyya	Kambata	Sidamo
1 sg.	*-enne*	*-ummo*	*-oommi*	*-ummo*
2 sg.	*-tette*	*-titto*	*-toonti*	*-itto*
3 sg. m.	*-e*	*-ukko*	*-o(ʔi)*	*-í*
3 sg. f.	*-te*	*-toʔo*	*-too(ʔi)*	*-tú*
3 sg. pol.	—	*-aakkoʔo*	*-semma(ʔi)*	*-ní*
1 pl.	*-nenne*	*-nummo*	*-moommi*	*-nummo*
2 pl.	*-tine*	*-takkoʔo*	*-teenta(ʔi)*	*-tiní*
3 pl.	*-ne*	*-toʔo*	*-too(ʔi)*	*-tú*

While the suffixes of the present perfect in Hadiyya, Kambata, and Sidamo are as follows (cf. Hudson 1976:264—265):

Person	Hadiyya	Kambata	Sidamo
1 sg.	*-aammo*	*-eemmi*	*-oommo*
2 sg.	*-taatto*	*-tenti*	*-otto*
3 sg. m.	*-aakko*	*-eeʔi*	*-inó*
3 sg. f.	*-taʔokko*	*-teeʔi*	*-tinó*
3 sg. pol.	*-aakkaʔokko*	*-eemma(ʔi)*	*-noonni*
1 pl.	*-naammo*	*-neemmi*	*-noommo*
2 pl.	*-takkaʔokko*	*-teenta*	*-tinonni*
3 pl.	*-taʔokko*	*-teeʔi*	*-tinó*

The suffixes of the imperfect are as follows (cf. Hudson 1976:265):

Person	Gedeo / Darasa	Hadiyya	Kambata	Sidamo
1 sg.	*-anno*	*-oommo*	*-aammi*	*-eemmo*
2 sg.	*-tatto*	*-tootto*	*-taanti*	*-atto*
3 sg. m.	*-aani*	*-ookko*	*-ano*	*-anno*
3 sg. f.	*-taani*	*-tamo*	*-taaʔi*	*-tanno*
3 sg. pol.	—	*-aakkamo*	*-eenno*	*-nanni*
1 pl.	*-nanno*	*-noommo*	*-naammi*	*-neemmo*
2 pl.	*-tinaa*	*-takkamo*	*-teenanta*	*-tinanni*
3 pl.	*-naani*	*-tamo*	*-taaʔi*	*-tanno*

The suffixes of the subordinate conjugation in Kambata and Sidamo are as follows (cf. Hudson 1976:270):

Person	Kambata	Sidamo
1 sg.	*-a*	*-a*
2 sg.	*-ta*	*-ta*
3 sg. m.	*-a*	*-a*
3 sg. f.	*-ta*	*-ta*
3 sg. pol.	*-eena*	*-na*
1 pl.	*-na*	*-na*
2 pl.	*-teena*	*-tina*
3 pl.	*-ta*	*-ta*

According to Ehret (1980:65), in Southern Cushitic, "[t]he basic person marking was constructed of the verb stem plus suffixes of the two shapes -V and -VCV, as the following comparison of West Rift and Dahalo conjugations indicates":

Person	Proto-SC	Burunge	Iraqw	Dahalo
1 sg.	**-o*	*-Ø*	*-Ø*	*-o*
2 sg.	**-ito*	*-id*	underlying **-it*	*-V̲to*
3 sg. m.	**-i*	*-i*	underlying **-i*	*-i*
3 sg. f.	**-ito*	*-id*	**-t*	*-V̲to*
1 pl.	**-anu*	*-an*	*-an*	*-Vnu*
2 pl.	**-ite*	*-idey*	underlying **-ta*	*-V̲te*
3 pl.	**-eye* and **-iye*	*-ey*, *-i*	underlying **-iya*, also *-ir*	*-ee*

Finally, Bender (2000:202) lists the following verbal affixes in the *ta/ne* (TN) branch of Omotic:

Person	NWO	SEO	C'	MO	G	Y	K	TN
1 sg.	**n*; *a*	*t(i)*	*e ?*	**n ~ t*	*u*	*an; ut*	**n*; **e*	—
2 sg.	**-*; *a*	*n(i)*	*a ?*	**a*	*u/en*	*at+á;*	**i(n)*	—
3 sg.	**-*; *i*	*(e)s*	*e ?*	**e ~ i*	*u*	*é; na*	**é*	**e*
3 sg. f.	**u*; *a*	*is*	—		*u*	*à*	**a*	**a*
1 pl.	**n*; *i*	*uni*	*i ?*	**ni*	*u*	*ni*	**o/u(n)*	**uni*
2 pl.	**et+i*; *i*	*t ~ n*	*i ?*	**ti*	*end*	*eti*	**ot*; **no*	**eti*
3 pl.	**on+a*; *i*	*usi*	*i ?*	**i*	*end*	*son+e*	**et*; **no*	**on-*

> Abbreviations: NWO = Northwest Ometo; SEO = Southeast Ometo; C' = C'ara; MO = Macro-Ometo; G = Bench / Gimira; Y = Yemsa / Janjero; K = Kefoid; TN = *ta*/*ne* branch of Omotic.

The 1st person possessive suffix in *-*m* was thus common to Indo-European, part of Afrasian (Highland East Cushitic), Uralic, and, within Altaic, Turkic and Tungus, while the 2nd person in *-*t* was common to Indo-European, Uralic, Tungus, Elamo-Dravidian, and Afrasian, and the 3rd person in *-*s* was common to Indo-European, Uralic, Turkic, Elamite, and Kartvelian (cf. Old Georgian *c'er-s* 'writes'). The 3rd singular possessive suffix was *-*n* in Proto-Tungus, and this mirrors what is found in the 3rd plural in Indo-European and Kartvelian (cf. Old Georgian 3rd plural suffix *-en* in, for example, *c'er-en* 'they write', Mingrelian 3rd plural suffix *-an*, *-a*, *-n*, Laz 3rd plural suffix *–an*, *-n*), in Berber (cf. Kossmann 2012:44—47) and Beja / Beḍawye (cf. Appleyard 2007a:467), and partially in the 3rd singular and plural suffixes and Highland East Cushitic, with traces in Omotic (see above) and perhaps Semitic (R. Stempel [1999:105—106] takes the 3rd plural froms in *-*n(a)* to be late formations taken over from the 2nd plural, while Moscati [1964:140] suggests that they are due to analogy with certain personal pronouns) — there is also a parallel here in Sumerian (see Chapter 15). As noted by Fortescue (1998:99), it is also found in Chukchi-Kamchatkan:

> Although, as we have seen, C[hukchi-]K[amchatkan] does not have personal possessor affixes of the E[skimo-]A[leut] type, it seems that there are traces of a 3rd person possessor marker remaining, of the same type found in Yukaghir before case endings (to be discussed in 5.1.2). Thus the 3rd person marker -(ə)n is frozen into position following the stem in the 'Class 2' noun declension for definite, individualized persons (in Chukchi mainly proper names, elder kinship terms and some other animates, including nicknames for domestic reindeer and names of animals in myths).

Within Indo-European, the 2nd singular ending *-t^h is preserved in Hittite and Tocharian. This was later replaced by what had been the 3rd singular, namely, *-*s*. In his 1962 book entitled *Indo-European Origins of the Celtic Verb. I: The Sigmatic Aorist*, Calvert Watkins discusses the extensive evidence from the Indo-European daughter languages for an original 3rd singular ending in *-*s*. It was Watkins who also showed that the 3rd singular indicative was originally characterized by the fundamental ending *zero*. The *-*n*- found in the 3rd plural was a relic of the 3rd person ending found in Tungus, Kartvelian, and Sumerian. The development of the 3rd singular ending *-t^h was a later change, though this still occurred fairly early since it is found in Hittite and the other Anatolian daughter languages — this *-t^h was added to the 3rd plural ending *-*n*- at the same time, yielding the new ending *-nt^h-. This *-t^h probably had the same origin as the 3rd singular possessive suffix *-*t* found in Ugric and some of the Samoyed languages on the one hand and in the Proto-Tungus 3rd plural possessive suffix *-*t* on the other (cf. Sinor 1988:727—728). It is also found in Berber (cf. Tuareg 3rd person pronominal affix: [m. sg.] *-t*, [f. sg.] *-tət*; [m. pl.] *-tən*, [f. pl.] *-tənət*). The most recent change must have been the

development of the so-called "primary" endings, which were built upon the so-called "secondary" endings by the addition of the deictic particle *-*i* meaning "here and now", as shown by Kerns and Schwartz in their book on Indo-European verb morphology (1972:4). It may be mentioned that this deictic particle had a Nostratic origin, coming from a widely-represented proximate demonstrative stem meaning 'this one here'.

Now, Proto-Uralic is assumed to have had two conjugational types (cf. Hajdú 1972:43—44; Collinder 1960:308): (A) a determinative (objective) conjugation, which was characterized by the 3rd singular in *-*s* and which was used with transitive verbs, and (B) an indeterminative (subjective) conjugation, which was characterized by the 3rd singular in *zero* and which was used with intransitive verbs. The same two conjugational types existed in Proto-Indo-European, except that the contrast was between active and stative. Indeed, the active ~ stative contrast appears to be the more ancient in both Proto-Uralic and Proto-Indo-European.

After all of the changes described above had taken place, the resulting Proto-Indo-European athematic endings were as follows (cf. Brugmann 1904:588—594; Beekes 1995:232—233; Burrow 1973:306—319; Szemerényi 1990:356—357 and 1996:327; Fortson 2010:92—93; Clackson 2007:123—125; Shields 1992; Meillet 1964:227—232; Watkins 1998:60; Meier-Brügger 2003:178; Sihler 1995:454; Adrados 1974.II:619—663; Ringe 2006:31):

	I. Primary		II. Secondary	
Person	Singular	Plural	Singular	Plural
1	*-*mi*	*-*me*	*-*m*	*-*me*
2	*-*si*	*-*t^he*	*-*s*	*-*t^he*
3	*-*t^hi*	*-*nt^hi*	*-*t^h*	*-*nt^h*

Note: The 1st person plural endings have different extensions in the various daughter languages: *-*me-s(i)*, *-*mo-s(i)*, *-*me-n(i)*, *-*mo-n(i)*. In these endings, the plural markers *-*s* and *-*n* have been added to *-*me*/*-*mo*. It may be noted that the plural marker *-*n* is also found in Tungus — in Evenki, Even, Solon, Negidal, for example, the 2nd plural possessive suffix is made up of the 2nd singular possessive suffix plus the plural marker *-*n* (cf. Sinor 1988:727).

In volume 1, Grammar, of his book *Indo-European and Its Closest Relatives: The Eurasiatic Language Family*, Greenberg (2000:67) discusses the evidence for a Eurasiatic first-person singular pronoun stem **k*. He writes:

> Less widely distributed than *m* for the first-person singular is *k*. Wherever they both appear, the general contrast is *m* as ergative versus absolutive *k*, *m* as active versus middle or passive *k*, and *m* as active versus stative *k*. I am inclined to believe that this last contrast is the basic one from which the others developed. A contrast of this kind between *m* and *k* seems to be attested only in the first-person singular.

Over the past quarter century or so, several scholars have tried to show that Indo-European is to be reconstructed as an active language (for a brief discussion, cf. Schwink 1994:86—87 and 89—110; see also Lehmann 2002). Indeed, such an interpretation seems to clarify many problems in the early dialects. According to this interpretation, the so-called "perfect" of traditional Indo-European is seen as originally stative (cf. Lehmann 1993:218 and 2002:169—172; see Chapters 19 and 20 for details). Comparison with other Nostratic languages allows us to confirm this view.

The perfect reconstructed by the Neogrammarians for Proto-Indo-European was distinguished from the present and aorist by a unique set of personal endings in the indicative, namely, first person singular *-*ḫ₂a* (cf. Sanskrit *véd-a* 'I know', Greek οἶδ-α, Gothic *wait*), second person singular *-*tḫ₂a* (cf. Sanskrit *vét-tha* 'you know', Greek οἶσ-θα, and Gothic *waist*), third person singular *-*e* (cf. Greek οἶδ-ε 'he/she knows', Sanskrit *véd-a*, and Gothic *wait*). Except for Armenian and Balto-Slavic, the perfect remained in all branches. It was least changed in Indo-Iranian, Celtic, and Germanic. In Greek, however, it was mixed up with a κ-formation and, in Italic, with a whole series of non-perfect tense forms. According to Greenberg, the perfect of traditional comparative grammar was originally stative in Proto-Indo-European, and, as noted above, others have recently made similar assertions. Sihler (1995:564—590) gives an excellent overview of the stative in Indo-European.

Now, Greek has a unique formation, the so-called "κ-perfect". However, this formation arose exclusively within prehistoric Greek. It is already found, to a limited extent, in Homer and in the earliest records of other dialects. In Homer, the formation is found in some 20 roots, all ending in a long vowel, and, in all of them, the κ-stem is virtually limited to the singular stems which actually contain a long vowel. Later, the formation spread to other stems ending in a long vowel, then to stems ending in any vowel (including denominatives), and finally to stems ending in consonants, and to all persons and numbers. Thus, it is clear that we are dealing with developments specific to Greek itself. For a discussion of the Greek perfect, cf. Chantraine 1927; see also Kerns—Schwartz 1972:14.

In Latin, we find first singular perfect forms *fēcī* 'I did' and *iēcī* 'I threw'. As in Greek, the *-c-* [k] is found in all persons (cf. third singular *fecit*), and, as in Greek, the *-c-* [k] has given rise to secondary formations (such as *faciō* and *iaciō*, for example).

The *-k-* forms are also found in Tocharian, as in first singular preterite active *tākā-* 'I was', and, as in Greek and Latin, the *-k-* is found in all persons and has given rise to secondary formations. Van Windekens (1976—1982.I:495—496) goes so far as to posit Proto-Indo-European **dhēq-*, **dhə₁q-* as the source of Tocharian *tākā-* 'I was'.

On the basis of the evidence from Greek, Latin, and Tocharian, we may assume that a "suffix" *-*k-* is to be reconstructed for late-stage Proto-Indo-European, that is, what I refer to as "Disintegrating Indo-European". This "suffix" originally had a very limited distribution — it seems to have appeared only in the perfect singular of verbs that ended in a long vowel, when the long vowel originated from earlier short vowel plus laryngeal. All of the other formations found in Greek, Italic, and

Tocharian are secondary elaborations. But, we can go back even farther — we can speculate that the *-*k*- originally characterized the first person exclusively, from which it spread to other persons. This suggestion is not new. Sturtevant (1942:87—88) suggested that *-*k*- developed in the first person singular when a root-final laryngeal was followed by the ending *-*xe* (that is, *-H_2e [Kuryłowicz would write *-$ə_2e$]). Though a laryngeal explanation along these lines has not been generally accepted (cf. Messing 1947:202—203), the suggestion that the -*k*- was originally confined to the first person singular is still a viable hypothesis, especially in view of the evidence from other Nostratic languages. Thus, both in function and form, the first singular *-*k*- ending would belong with the Eurasiatic first person singular pronoun stem **k* reconstructed by Greenberg. It should be noted that this explanation is different than that given by Greenberg, who compares the Proto-Indo-European first person perfect (stative) ending *-*Ha* with the *-*k*- endings found in the other Eurasiatic languages. On purely phonological grounds, I find Greenberg's proposal less convincing than the alternative suggested here. Moreover, the first person perfect ending *-*Ha* has a exact match in Elamite (see above), which clearly shows that it was inherited from Proto-Nostratic and, thus, not related to the *-*k*- endings under discussion here.

17.10. PROHIBITIVE/NEGATIVE PARTICLES AND INDECLINABLES

The following negative/prohibitive particles and indeclinables can be reconstructed for Proto-Nostratic:

Negative particles: **na*, **ni*, **nu*
Prohibitive particle: **ma(ʔ)*
Negative particle: **ʔal-* (~ **ʔəl-*)
Negative particle: **li* (~ **le*) (?)
Negative particle: **ʔe*
Post-positional intensifying and conjoining particle: *$k^{wh}a$- (~ *$k^{wh}ə$-)
Particle: *$k^{wh}ay$- 'when, as, though, also'
Particle: **ħar^{y}-* 'or; with, and; then, therefore'
Particle: **ʔin-* (~ **ʔen-*), **(-)ni* 'in, into, towards, besides, moreover'
Sentence particle: **wa* (~ **wə*) 'and, also, but; like, as'
Coordinating conjunction: **ʔaw-*, **ʔwa-* (~ **ʔwə-*) 'or'

Note: The *CVC*- root structure patterning of some of these forms points to their ultimate nominal or verbal origin. For example, the negative particle **ʔal-* (~ **ʔəl-*) must ultimately have been a negative verb stem meaning 'to be not so-and-so', as in its Dravidian derivatives, while **ʔin-* (~ **ʔen-*), **(-)ni* was originally a nominal stem meaning 'place, location' (cf. Dolgopolsky 2008, no. 45, **ʔinī[A]* 'place' [(in descendant languages) → 'in']).

17.11. ILLIČ-SVITYČ'S VIEWS ON PROTO-NOSTRATIC MORPHOLOGY

Illič-Svityč never published his views on Nostratic morphology during his lifetime. However, his notes were gathered together and published by Vladimir Dybo in 2004 in the proceedings of the Pécs Centennial Conference, edited by Irén Hegedűs and Paul Sidwell. According to Illič-Svityč, Proto-Nostratic was an inflected language, apparently of the accusative type. It had both nouns and adjectives. Nominal declension was only available in the singular. Adjectives were declined only if they were substantivized and used independently. Illič-Svityč reconstructs the nominal paradigm as follows:

1. Nominative-accusative: *-*Ø* (zero); used for subject and unmarked object;
2. Marked object: *-*mʌ*; used if the object had to be topicalized in the sentence if the possibility existed for an ambiguous interpretation of the phrase and if a definite object was indicated;
3. Genitive (connective): *-*n*; possessive, etc.;
4. Instrumental: *-*tʌ*;
5. Local cases: Lative: *-*ḳa*;
   Ablative: *-*da*;
   Essive (locative): *-*n*.

Plurality was primarily indicated by a special marker: *-*t*. Illič-Svityč also reconstructs an oblique plural marker *-*j*, though he notes that this is less certain.

Illič-Svityč reconstructs the following types of personal pronouns:

1. Independent pronouns — specifically for indicating the pronominal subject;
2. Forms of the subject standing by a verb, primarily in a position preceding a noun;
3. Forms of the direct object of a verb, primarily in a position preceding a noun after the form of the subject;
4. Possessive forms next to nouns, primarily in a position after a noun.

Only the first and second person singular and plural pronouns were represented in these four types.

Illič-Svityč reconstructs the following stems for these types:

1. Independent pronouns; these stems could be extended by a facultative emphatic element *-*na*:

   1st person singular: **ʌke-na*;
   2nd person singular: **ṯʌ-na*;
   1st person plural: **naHe-na*;
   2nd person plural: ?

2. Forms of the subject of verbs:

   1st singular: **a-*;
   2nd singular: **ţa-*;
   1st plural: **na-*;
   2nd plural: ?

3. Forms of the direct object:

   1st singular: **mi-*;
   2nd singular: **k-*;
   1st plural: ?
   2nd plural: ?

4. Possessive forms:

   1st singular: **mi-*;
   2nd singular: **si-*;
   1st plural: **mʌn*;
   2nd plural: **sʌn*.

Illič-Svityč also posits the following demonstrative stems (fulfilling the function of 3rd person pronouns): **ţa-*, **šä-*, **mu-*; the following interrogative stems: **ķo* 'who?', **mi* 'what?'; and the following interrogative-relative stems: **ja*, **na* (?).

Illič-Svityč's views on verb morphology were not as well developed. He reconstructs an imperative as well as the following two opposing verb categories: (1) The first designated the action itself (transferred to the object in the case of transitive verbs). This was used with the subject pronoun and (in the case of transitive verbs) with the object pronoun. Here, the nominal direct object was the marked form, and the verb stem coincided with the infinitive. (2) The other verb form was a derived noun ending in **-a*. It indicated the state of the subject. If the verb were transitive, it contained only the prefix of the subject, and, in this case, the object noun could not be marked and thus always appeared in the subjective-objective case. Finally, Illič-Svityč suggests that there existed a temporal (or aspectual) distinction between these two basic verb categories, which was probably realized with the help of deictic particles of pronominal origin.

17.12. DOLGOPOLSKY'S VIEWS ON PROTO-NOSTRATIC MORPHOLOGY

Dolgopolsky's views on Proto-Nostratic morphology differ from those of Illič-Svityč. According to Dolgopolsky (2005), Proto-Nostratic was a highly analytic language. Dolgopolsky notes that Illič-Svityč, although recognizing the analytical status of many grammatical elements in Proto-Nostratic, still believed that some of them were agglutinated suffixes, specifically, the marker of oblique cases **-n* (=

Dolgopolsky's **nu* 'of, from'), the formative of marked accusative **-m[ʌ]* (= Dolgopolsky's **mA*), the plural marker **-NA* (= Dolgopolsky's **n̄[ä]*, used to mark collectivity and plurality), and several others. Dolgopolsky points out that Illič-Svityč's position is unacceptable inasmuch as the Proto-Nostratic formants in question still preserve the following traces of their former analytic status: (1) mobility within a sentence (a feature of separate words rather than suffixes); (2) the fact that several particles are still analytic in some of the Nostratic descendant languages; and (3) the fact that Proto-Nostratic etyma with grammatical and derivational function are sometimes identical with "autosemantic words". Specifically, Dolgopolsky states (2008:26—27, §4. Grammatical Typology [lightly edited here]):

> As we can see, Proto-Nostratic was a highly analytic language. In this point, there is a certain disagreement between Illič-Svityč and myself. Illič-Svityč, albeit recognizing the analytical status of many grammatical elements in Nostratic, still believed that some grammatical elements were agglutinated affixes: the marker of oblique cases **-n* (= my **nu* 'of, from'), the formative of marked accusative **-m* (= my **mA*), the plural marker **-NA* (= my **n̄[ä]* of collectiveness and plurality), and several others. This interpretation is hardly acceptable because the Nostratic etyma in question still preserve traces of their former analytic status: (1) they preserve some mobility within the sentence (a feature of separate words rather than affixes), (2) several Proto-Nostratic particles are still analytic in some descendant languages, (3) Nostratic etyma with grammatical and derivational function are sometimes identical with autosemantic words. Thus, the element **nu* 'of, from' functions in the daughter languages not only as a case suffix (genitive in Uralic, Turkic, Mongolian, Tungus, formative of the stem of oblique case in the Indo-European heteroclitic nouns, part of the ablative case ending in Turkic, Kartvelian, and in Indo-European adverbs), but also as a preverb of separation/withdrawal in Indo-European (Baltic), as an analytic marker of separation/withdrawal (ablative) in Baltic (functioning in post-verbal and other positions). The element **mA* is still analytic in Manchu (*be*, postposition of the direct object) and Japanese (Old Japanese *wɔ* > *Jo*). On the analytical status of *Jo* (< Nostratic **mA*), *no* (< N **nu*), cf. Vrd.JG 278-82. The element **n̄[ä]* functions not only as a post-nominal and post-verbal marker of plurality (> plural suffix of nouns in Kartvelian, Hamito-Semitic, and Altaic, ending of 3 pl. of verbs in Kartvelian, part of the Indo-European ending **-nti* ~ **-nt* of 3 pl.), but also as the initial marker of plurality or abstractness (← collectiveness) in Uralic and Egyptian pronouns: Finnish *nuo* (pl.) 'those' ↔ *tuo* (sg.) 'that', *ne* (pl.) 'those' ↔ *se* (sg.) 'that', Egyptian *nꜣ* abstract 'this' and 'these (things)' ↔ *pꜣ* 'this' (m.) ↔ *tꜣ* (f.). The animate plural deictic element (?) **yE* 'these, they' functions not only as the post-nominal marker of plurality (> plural ending in Indo-European, Uralic, Altaic, and Cushitic), but also as a pre-nominal and pre-pronominal plural marker (in Baltic, Beja, and Old English). The affix forming causative verbs in Hamito-Semitic may both precede the verbal root and follow it (e.g., in deverbal nouns), which points to an original analytic status of the corresponding Nostratic etymon. Hamito-Semitic **tw-* (prefix of reflexivization in derived verbs > Berber **tw-* → *t-* id., Semitic prefix and infix **[-]t-*, etc.)

> and the Anatolian Indo-European reflexive particle *-*ti* (> Hieroglyphic Luwian -*ti* 'sich', Luwian -*ti*, Lycian -*ti*, reflexive particle, Hittite *z*-, -*za* id.) are etymologically identical with Nostratic **tVwV* 'head' (preserved with this meaning in Kartvelian and Omotic), which proves the analytic origin of the marker of reflexivization. In the descendant languages, most of these grammatical auxiliary words and some pronouns turned into synthetic affixes (agglutinative in Early Uralic and Altaic, inflectional [fusional] in Indo-European and, to a certain extent, in Hamito-Semitic and Kartvelian).

Though Dolgopolsky seems to be implying that nominative-accusative structure is to be reconstructed for Proto-Nostratic, grammatical typology is actually not discussed by him. Some of the daughter languages do, indeed, exhibit nominative-accusative structure (Proto-Uralic, Proto-Altaic, and later stages of Proto-Indo-European), but others exhibit ergative-absolutive structure (Proto-Eskimo-Aleut and Proto-Chukchi-Kamchatkan), and still others exhibit stative-active structure (Proto-Afrasian, Proto-Kartvelian, early Proto-Indo-European, and probably Proto-Elamo-Dravidian [definitely Elamite]), with each of these different grammatical structures requiring a different type of clause alignment. No details are given as to how the inherited system was transformed into the systems found in the different daughter languages, nor is there any discussion of non-Nostratic languages or language families to show that the morphological structure being posited by Dolgopolsky for the Nostratic parent language has typological parallels in attested languages.

In actual fact, the type of grammatical structure that seems to be able to account best for the circumstances found in the Nostratic daughter languages is not nominative-accusative but, rather, stative-active, as explained earlier in this chapter. As noted above, this type of grammatical structure was found in Proto-Afrasian and Proto-Kartvelian. In addition, stative-active structure has been convincingly posited for earlier stages of Proto-Indo-European by a number of distinguished scholars (Karl Horst Schmidt; Winfred P. Lehmann; Thomas V. Gamkrelidze; Vjačeslav V. Ivanov, among others — for details, cf. Chapter 20 of this book).

Dolgopolsky (2005) reconstructs the following Proto-Nostratic morphemes:

1. **nu* postposition, adverb, and preverb 'from'; postposition 'of'
2. **mA* postposition denoting a direct object
3. **{y}iyo* 'which', 'that which, related to'; it underlies (a) suffixes of relative adjectives and (b) suffix of the genitive base. According to Dolgopolsky, the etymon in question also functions as a separate word.
4. ?? **h{a}ya* directive-designative particle 'for'
5. **t{ä}* 'away (from), from'; ablative (separative) particle
6. **bayV* 'place'; 'to be (somewhere)' (= Spanish *estar*)
7. **d[oy]a* 'place (within, below), inside' (→ locative particle)
8. **mENV* (= **mEńV* ?) 'from'
9. **yu[⊥]t[i]* 'with, beside' (⊥ = unspecified consonant)
10. **ʔVrV* (> **rV*) theme-focusing (topicalizing) particle
11. **ʔiñ{A}* 'place' (→ 'in' in daughter languages)
12. **šawV* '(in the) middle'

The origin of the nominative singular markers in the daughter languages:

1. Proto-Indo-European *-*s* < Proto-Nostratic **sE* demonstrative stem ‘he/she’;
2. Proto-Semitic *-*u* < Proto-Nostratic **{h}u* = demonstrative particle ‘iste’;
3. Proto-East Cushitic *-*i* and Proto-Kartvelian *-*i* < Proto-Nostratic **{h}i* demonstrative particle ‘iste’ (or ‘hic’). Dolgopolsky notes that all of these demonstrative stems still function as pronouns or definite articles.

The origin of the genitive case markers:

1. **nu* (see above)
2. **{y}iyo* (see above)
3. The pronominal particle **ha* ‘ille’ or **he* ‘that’ + pronominal **sE* ‘he/she’ (see above)

The origin of the gender markers (masculine):

1. **ʔa* marker of the male sex [from ‘(young) man’ ?]

The origin of the gender markers (feminine):

1. **{ʔ}atV* ‘female, woman’
2. **ʔ{ä}yV* (or **h{ä}yV* ?) ‘mother’ (originally a nursery word)
3. **ʔemA* ‘mother’
4. **ʔaʔV* ‘female’

The origin of the gender markers (neuter):

1. **ṭä* demonstrative pronoun of non-active (inanimate) objects
2. **mA* postposition denoting a direct object. This is the source of the Proto-Indo-European neuter marker *-*m* in thematic nouns and adjectives (cf., for example, Latin [nom. sg. masc.] *novus* ‘new’, [nom. sg. ntr.] *novum*), which goes back to the accusative marker *-*m*.

The origin of the plural forms:

1. **yE* (= **y{i}* ?) ‘these, they’ (animate plural deictic element)
2. **{ʔ}VśV* ‘they’
3. **ʔa{h}a* ‘thing(s)’ (collective particle of animate) (= French *de ça*)
4. **n|ṅ{ä}* pronoun of collectivity and plurality
5. **l|ɬarwV* ‘together, many’
6. **rV yE* (= **rV y{i}* ?) a compound pronoun of plurality
7. **tV* marker of plurality (‘together’)
8. **ʔ{o}mV* ‘kin, clan, everybody’

The origin of the nominal derivational affixes:

1. **mA* marker of nominalized syntactic constructions (= subordinate sentences), nominalizer (originally a pronoun) that formed analytic equivalents of *nomina actionis*, *nomina agentis*, and other derived nouns
2. **ṭi* syntactic particle; it is combined with verbs to build *nomina actionis*
3. **ṭV* marker of passive participial constructions
4. **n̄V* marker (pronoun) that formed analytic equivalents of passive participles (→ derived passive verbs)
5. **ʔVnṭV* 'he'; relative 'he who, that which' (in daughter languages → a suffix of participles and derived *nomina*)
6. **ç|ća* ~ **c|ća* (= **Hiç|ć|ća* ?) marker of relative constuctions (in daughter languages → suffix of adjectives)
7. **l̨e[ʔV]* (or **le[ʔV]V* ?) 'being, having' → analyticial (> synthetical) adjectivizer (→ formant of adjectives)
8. **y{a}* particle of hypocoristic (?) address (vocative)

The origin of the verbal affixes:

1. **mi* 'I'
2. **ṭ{ü}* (> **ṭi*) and its assibilated variant **ś{ü}* (> **śi*) 'thou'
3. **HoyV* (= **hoyV* ?) 'by me, my'
4. **n|ṅ{ä}* pronoun of collectivity and plurality (see above)
5. **n|ṅaʕi* 'to go' (→ 'to go to do something')
6. **ç|ci*, **ć\ći*, or **ĉ\ĉi* marker of verbal frequentativity/iterativity
7. **{s̄}Ew[0]V* 'to want, to beg' (→ desiderative)
8. **H{e}ṭV* 'to make' (> causitivizing morpheme)
9. **SuwYV* 'to push, to cause' (→ 'to ask for', → causative)
10. **t{a}wV* 'head' (→ 'oneself')
11. **woy[ʔ]E* ~ **wo[ʔ]yE* 'power, ability'
12. **me[y]n̄U* 'oneself, one's own; body'

Concerning the origin of root extensions, Dolgopolsky (2005) notes:

> But we cannot say the same about those elements of roots that are called "Wurzelerweiterungen", "Wurzeldeterminative", "root extensions", "élargissements", that is of those parts of roots of daughter languages (mostly root-final consonants) that are added or alternate without clear-cut and regular change of meaning. Some of them are probably explainable by lexical interaction of roots (Reimbildungen, influence of synonymic roots, etc.), but we cannot rule out the possibility that some of them reflect ancient (synthetic?) derivation. In order to elucidate this matter we need a systematic comparative investigation of all these "root extensions" [the extant literature (Persson 1901 for Indo-European, Hurwitz 1913 and Ehret 1989 for Semitic) has not produced satisfactory results, probably because each scholar worked with one daughter-family only

without broader comparison]. Up to now the question of these determinatives remains open.

Unfortunately, Dolgopolsky gives far too much weight to later stage branches such as Uralic and Altaic, and his reconstructions, consequently, are, for the most part, more applicable to Eurasiatic than to Nostratic. The same is true for Illič-Svityč.

17.13. STAROSTIN'S LIST OF PROTO-NOSTRATIC PRONOUNS AND PARTICLES

At the end of his paper "Nostratic and Sino-Caucasian", Sergej Starostin (1989: 64—65) compares various Proto-Nostratic pronouns and particles with Proto-Sino-Caucasian. Though it is beyond the scope of this book to discuss the merits or demerits of the Sino-Caucasian hypothesis, it is worth repeating Starostin's list, leaving out the Sino-Caucasian data he cites. Curiously, even though he specifically rejects (1989:45—46) my revision of the Proto-Nostratic phonological system and the sound correspondences that are used as the basis for that revision, it is my reconstructions that Starostin uses for the Proto-Nostratic stops as opposed to the reconstructions of Illič-Svityč and Dolgopolsky. Here is his list (my reconstructions are given in a separate column for comparison, together with the number of each item as it appears in Chapter 16 of this book):

	Starostin	Bomhard (this book)	
1.	Proto-Nostratic **mi* (**mV*) 'I'	**mi*	16.3
2.	Proto-Nostratic **mä* prohibitive particle	**ma(ʔ)*	16.56
3.	Proto-Nostratic **mu* 'this, that'	**ma/i/u*	16.63
4.	Proto-Nostraitc **mi* 'what'	**mi*	16.61
5.	Proto-Nostratic **tʹä* 'this, that'	**t^ha/i/u*	16.15
6.	Proto-Nostratic **ʔi/*ʔe* 'this'	**ʔi*	16.13
7.	Proto-Nostratic **ʔa* 'that'	**ʔa*	16.13
8.	Proto-Nostratic **sa* demonstrative pronoun	**ša*	16.16
9.	Proto-Nostratic **kʹa/*kʹo* 'who'	**k^{wh}a*	16.59
10.	Proto-Nostratic **da* locative particle	**da*	16.35
11.	Proto-Nostratic **ʔe* negative particle	**ʔe*	16.58
12.	Proto-Nostratic **ja* 'which, what'	**ʔay-*	16.60
13.	Proto-Nostratic **-jV* diminutive suffix	(**-y-*	16.40)
14.	Proto-Nostratic **-j(V)* plural particle		
15.	Proto-Nostratic **-kʹa* diminutive suffix	(**-k^h-*	16.44)
16.	Proto-Nostratic **kʹ/o/* postpositive emphatic particle	**k^{wh}a*	16.65
17.	Proto-Nostratic **kʹV* directive particle	**-k^ha*	16.31
18.	Proto-Nostratic **-l/a/* collective suffix	**-la*	16.25
19.	Proto-Nostratic **ɬA* locative particle		
20.	Proto-Nostratic **-nV* oblique noun suffix	**-nu*	16.28

21. Proto-Nostratic **NA* demonstrative pronoun	**na*	16.18
22. Proto-Nostratic **-NA* plural suffix	**-nV*	16.26

17.14. CONCLUDING OBSERVATIONS

In this chapter, an attempt has been made to show that Proto-Nostratic exhibited many of the characteristics of an active-stative language. One of the objections that has been raised against this view is the alleged comparative rarity of active-stative languages in Eurasia. This problem has been admirably dealt with by Johanna Nichols in her 2008 paper entitled "Why are Stative-Active Languages Rare in Eurasia? A Typological Perspective on Split-Subject Marking", and it is well worth repeating her conclusions (2008:134):

> Why are stative-active languages rare in Eurasia? On the basis of what has been argued here, three different answers might be given to this question. The first is that they are not in fact rare in Eurasia; S.g and S.poss, which are variants or counterparts or allo-codings of S.o, are common in Eurasia, where they take the form of dative experiencer subjects.
>
> A different, narrower answer can be given using the classical definition of stative-active and excluding S.g marking: they are rare in Eurasia because primary object alignment is rare there.
>
> A third answer would be that they are only rare in *northern* Eurasia. S.g coding of experiencer subjects is common across southern Eurasia from the Pyrenees through the Caucasus to the Himalayas and South Asia. There is a northward extension in the form of Germanic and Balto-Slavic, but the north central and northeast of Eurasia (including Siberia, Manchuria, Mongolia, and Central Asia) is almost entirely lacking in oblique subject marking of any kind.

And, further (2008:135):

> The lexical-typological approach taken here has shown the complementarity and fundamental non-distinctness of S.o and S.g coding, and it has also shown that alignment is a continuum. Once a set of the same verb glosses is surveyed across a sample of languages, discrete types such as accusative, ergative, and stative-active begin to fade and run together. Furthermore, we have seen that, even if discreteness is not required for identifying types, stative-active or split-subject is not a third major alignment type; the difference between it and either ergative or accusative is one of degree.

The conclusions reached by Nichols are complemented by a study done by Gregory D. S. Anderson (2006b:25—26), who points out that there has been a long and complicated interaction among the indigenous languages of Siberia, which has led to the development of a cluster of shared features (at the expense of earlier ones):

> From a macro-areal perspective, despite the obvious fact that the indigenous languages of Siberia exhibit considerable genetic and typological diversity with respect to one another, they nevertheless possess a cluster of

features that pattern with one another but are not logically or typologically connected. These include features of the phonology, systems of nominal and verbal morphology, and the syntax of the simple and complex sentence. With regards to nominal morphology, two characteristic features of case systems commonly attested in the languages of Siberia were discussed in some detail above. These include on the one hand, an opposition between dative and allative case forms, and on the other, a formal contrast between instrumental and comitative case functions.

In the first instance (the dative: allative opposition), the feature primarily clusters around languages that have had significant and prolonged interaction with Tungusic languages (except Turkic, where the opposition is clearly old). In the case of the instrumental: comitative opposition, the directions of influence are more complex. Some groups clearly reflect an old opposition (Yukaghiric, Chukotko-Kamchatkan, Mongolic). With others (e.g. Tungusic, Turkic, Ob-Ugric) the situation is less clear. Northern Tungusic languages might reflect Chukotko-Kamchatkan influence, but Yukaghiric influence is perhaps more likely in this instance (large numbers of Yukaghiric speakers shifted to Northern Tungusic). The northeastern Turkic varieties on the other hand may well reflect secondary and later Northern Tungusic influence, albeit reinforcing a potentially archaic contrast. The situation with the western and central Siberian languages is also not clear at present. Ob-Ugric seems to have innovated this contrast fairly early, at the proto-language level; however, its trigger is currently opaque. Sel′kup is even more confusing as the opposition is quite recent, and Khanty influence is possible as an explanation, but this is far from certain.

As is probably obvious from the present discussion, the features of the Siberian linguistic macro-area cluster around those of the Northern Tungusic languages and this is not by accident. Indeed, the highly mobile Evenki (and to a lesser degree its sister language Even) have both the local bilingualism relationships and wide-spread distribution necessary to make them likely vectors of diffusion for at least certain of these features, whether they be older Tungusic features (the dative: allative contrast) or seemingly later innovations (the instrumental: comitative opposition). However, Tungusic > non-Tungusic is in no sense the only direction of influence apparent in these developments, but rather one in a highly complex mosaic of linguistic interactions operative over centuries and millennia across the languages of the macro-region. To be sure, an understanding and elucidation of the multifaceted dynamics of diffusion and borrowing evidenced by the distribution of these and numerous other potential areal features unfortunately still remain in their infancy. Further insights into the complex histories of the case systems and other features of the languages of the Siberian linguistic area must await future research.

CHAPTER EIGHTEEN

NOSTRATIC MORPHOLOGY III: DERIVATIONAL MORPHOLOGY

18.1. INTRODUCTORY REMARKS

The fundamental principles governing derivational morphology will be outlined in this chapter. We will begin by discussing the individual branches before discussing Proto-Nostratic. Some of what follows is repeated elsewhere in this book.

Derivational morphology, or "word formation", is the process of adding an affix to a word to change its grammatical category or to alter the meaning of a word — that is to say, to create nouns from verbs, verbs from nouns, adverbs from adjectives, new nouns from existing nouns, new verbs from existing verbs, etc. Derivational affixes can be added to both underived and derived stems. Conversely, inflectional morphology specifies the grammatical relationships among words in a sentence — inflectional morphology does not change the grammatical category of a word, nor does it alter its meaning. Cf. Booij 2006; Matthews 1972 and 1991. In Proto-Nostratic, the distinction between derivational morphology and inflectional morphology was clear-cut, though this is not always the case cross-linguistically.

18.2. AFRASIAN

1. AFRASIAN: According to Ehret (1995:15—54), there were two fundamental stem shapes in Proto-Afrasian: **CVC*- and **C(V)*-, the latter of which had the possible alternative shape **VC*- in verb stems. Any number of nominalizing suffixes and a great variety of verb extensions in the shape *-*(V)C*- could be added to the stem. Ehret notes that the underlying form of such suffixes was probably *-*C*-, with the surfacing of a preceeding vowel depending upon the syllable structure rules of the particular Afrasian daughter branches. Accordingly, the reconstructed Proto-Afrasian stems in Chapter 5 of Ehret's book are given as *$C_1VC_2C_S$, where *C_S represents the suffix. Two exceptions to these rules were the nominal suffixes *-*w*- and *-*y*-, which probably did not have fixed vowel accompaniments and *-*VC*- shapes. Ehret devotes several other papers to the study of root structure patterning in the individual Afrasian daughter languages (cf. Ehret 1989 for Arabic, 2003a for Ancient Egyptian, 2003b for Chadic, and 2008a for Chadic and Afrasian). It may be noted here that Militarëv (2005:83) dismisses Ehret's proposals as "arbitrary conclusions".

   Now, let us turn to the individual derivational suffixes. Ehret (1995:15—54) lists and defines seventeen Proto-Afraisan noun suffixes and thirty-seven Proto-Afrasian verb extensions — the following is a complete list (Ehret's transcription has been retained) (see also Hayward 1984b):

Proto-Afrasian Noun Suffixes:

Suffix	Meaning
*-b-	animate nominal and deverbative nominal
*-l-	adjective forming
*-l-	attributive and complement deverbative
*-m-	adjective forming
*-m-	attributive nominal
*-n-	adjective forming
*-n-	attributive nominal
*-ŋ-	attributive nominal
*-r-	adjective forming
*-r-	instrument and complement deverbative
*-s-	deverbative complement
*-t-	adjective forming
*-t-	associative nominal
*-w- (-aw-)	deverbative
*-y- (-ay-, -iy-)	adjective forming
*-y- (-ay-, -iy-)	attributive deverbative and attributive nominal
*-ʔ-	adjective deverbative

Proto-Afrasian Verb Extensions:

Suffix	Meaning
*-b-	extendative
*-c’-	extendative
*-d-	durative
*-dl-	middle voice
*-dz-	extendative fortative
*-f-	iterative
*-g-	finitive fortative
*-ɣ-	intensive (of effect)
*-gʷ-	durative
*-ɣʷ-	complementive
*-h-	amplificative
*-ḥ-	iterative
*-k-	durative
*-k’-	intensive (of effect)
*-kʷ-	finitive
*-k’ʷ-	andative
*-l-	finitive
*-ɬ-	ventive
*-m-	extendative
*-n-	non-finitive
*-p-	intensive (of manner)
*-p’-	finitive fortative

*-r-	diffusive
*-s-	causative
*-š-	non-finitive
*-s'-	fortative
*-t-	durative
*-t'-	durative intensive
*-tl'-	focative
*-ts-	diffusive
*-w-	inchoative/denominative
*-x-	precipitive
*-x^{w}-	extendative fortative
*-y-	inchoative/denominative
*-z-	intensive (of manner)
*-ʔ-	concisive
*-ʕ-	partive

Ehret notes (1995:27—28) that these extensions have become lexicalized in Semitic and Egyptian, with the result that their meanings have mostly been lost. Ehret further notes that these extensions must originally have been fully productive in Chadic, while Cushitic occupies an intermediate position between Semitic and Egyptian, on the one hand, and Chadic, on the other hand, in the preservation and productivity of these extensions.

2. CUSHITIC: For Proto-Southern Cushitic, Ehret (1980:45—46) proposes an underlying system of two primary stem shapes for nouns, verbs, and adjectives: **CVC*- and **CVCVC*-. Ehret considers the three relatively uncommon stem types **CVNC*-, **CVNCVC*-, and **CVCVNC*- to be varieties of the two primary stem types. Demonstrative, locational, and pronoun stems in Proto-Southern Cushitic, on the other hand, had the shape **CV*-.

   For Proto-East Cushitic, Sasse (1979:6) outlines the following root structure rules:

   1. Each root began with one and only one consonant — there were no initial consonant clusters.
   2. No (or very few) words ended in a consonant, that is to say that all inflectional morphemes consisted of or ended in vowels.
   3. There were no **CCC* clusters and possibly some rigorous restrictions on **CC* clusters as well.
   4. The following root shapes mainly occurred: **CV(C)*, **CVCCVC*, **CVCC*, **CVCV*.
   5. In addition to the root shapes listed above under 4, Proto-East Cushitic had a considerable number of verbs with a discontinuous consonantal root structure similar to what is found in Semitic verbs of the prefix conjugation: **C*$_1$-*C*$_2$ or **C*$_1$-*C*$_2$-*C*$_3$, from which stems were derived by fixed vocalic patterns.

3. SEMITIC: Semitic requires special consideration. Semitic has developed a system of non-concatenative morphology in which the consonants (almost always three: C_1-C_2-C_3) indicate the basic meaning of a root while the alternation of vowels according to fixed patterns within the root indicates various morphological, derivational, and syntactic functions (cf. Moscati 1964:72—75; Brockelmann 1910:113—114 and 1916:96—97; Bergsträsser 1928:6—7 and 1983:5—6; Coghill 2015; Diakonoff 1970; Hurwitz 1913; Kuryłowicz 1962 and 1973; Lipiński 1997:201—209 and 331—335; Rubin 2010:26—28 and 43—47; A. K. Simpson 2009; R. Stempel 1999:69—74; Weninger 2011a:152—155). No doubt, this system began in verbs and then spread to nouns as well (see below on the origin of apophony). These patterns are referred to as "binyans" / "binyānīm" (בִּנְיָנִים) in Hebrew grammar. Though this patterning was incipient in the latest period of development of Proto-Afrasian, Semitic (as well as Ancient Egyptian [cf. Loprieno—Müller 2012:117—119; Ehret 2003a] and Berber [cf. Kossmann 2012:34—36]) has greatly expanded this system, with the result that parts of the earlier patterning have either been lost or modified to conform with the triliteral system (see below [Militarëv]). The system is further enhanced by the addition of various prefixes and/or suffixes, again, in accordance with predefined templates. Pronouns and particles, however, fall outside of this system. The use of prefixes, infixes, and suffixes occurs in every branch of Afrasian, as do gemination and reduplication (cf. Frajzingier 2012:529—532).

Militarëv (2005) identifies a set of "triconsonantizers" (T) for Proto-Semitic (specifically, **w*, **y*, and **ʔ* — probably also **t*, **ʕ*, and **h*) which were added to biconsonantal roots to bring them into conformity with the triliteral system. These "triconsonantizers" could be added initially (*T+C_1-C_2), medially (*C_1+T+C_2), or finally (*C_1-C_2+T). The addition of a "triconsonantizer" did not affect the meaning of the root. However, when the meaning of the root was modified, Militarëv classifies the additional consonant element as a "fossilized formant" (or "class marker") (= "derivational suffix" according to my views [cf. Chapter 17, §17.5]). Though any consonant could theoretically have functioned as a fossilized formant, Militarëv lists the following as being more firmly established: **m*, **n*, **t*, **r*, **l*, **ʔ*, **b*, and **k* (and possibly **ħ*). Finally, Militarëv identifies a set of "root extenders" (RE), which were added to roots with three (or more) consonants: *C_1-C_2-C_3+C_{RE}.

According to Weninger (2011a:164), the following affixes are the most important in noun derivation in Semitic: **ma-*, **mi-*, **mu-*, **ta-*, **ti-*, **ʔa-*, **ʔi-*, **ʔu-*, and **-ān*. Most nouns, however, can be classed into a somewhat limited set of patterns in Proto-Semitic — Weninger (2011a:164) lists the following such patterns, using **ḳtl* as an example (Weninger writes **qtl*): **ḳatl*, **ḳitl*, **ḳutl*, **ḳatal*, **ḳatil*, **ḳatul*, **ḳatāl*, **ḳatīl*, **ḳatūl*, **ḳutul*, **ḳutūl*, **ḳital*, **ḳutal*, **ḳitāl*, **ḳutāl*, **ḳātil*, **ḳattăl*, **ḳatti/ul*, **ḳattīl*, **ḳattūl*, and **ḳuttŭl*. Weninger discusses Semitic verb stem formation and derivation on pp. 155—159.

Proto-Semitic also had a set of root structure constraints that restricted which consonants could co-occur in a triliteral root (that is, C_1-C_2-C_3) (cf.

Greenberg 1950; Moscati 1964:74—75; Rubin 2010:27). Thus, the first (C_1) and second (C_2) consonants within a root could not be identical. Moreover, they could not share the same point of articulation. The first constraint did not apply to the second (C_2) and third (C_3) consonants, while the second constraint did. Initial and final consonant clusters were avoided, as were medial clusters of more than two consonants (cf. Gragg—Hoberman 2012:163).

As noted by Lipiński (1997:201—209), there were three fundamental stem types in Proto-Semitic: (1) verb stems, (2) noun and adjective stems, and (3) pronoun and indeclinable stems, though the distinction between nouns and verbs was not always clear. Uninflected forms included adverbs, prepositions, and various connective and deictic particles. Lipiński further notes that there were many deverbative nouns and denominative verbs in Proto-Semitic.

4. THE ORIGIN OF APOPHONY: In Chapter 7 (§7.14), the Proto-Afrasian root structure patterning was reconstructed as follows:

    1. There were no initial vowels in the earliest form of Proto-Afrasian. Therefore, every root began with a consonant. (It may be noted that Ehret [1995] assumes that roots could begin with vowels in Proto-Afrasian.)
    2. Originally, there were no initial consonant clusters either. Consequently, every root began with one and only one consonant, exactly as in Proto-East Cushitic mentioned above. There must also have been restrictions on permissible medial and final consonant clusters, again, as in Proto-East Cushitic and also Semitic.
    3. Two basic syllable types existed: (A) **CV* and (B) **CVC*, where *C* = any consonant and *V* = any vowel. Permissible root forms coincided with these two syllable types.
    4. A verb stem could either be identical with a root or it could consist of a root plus a single derivational morpheme added as a suffix to the root: **CVC-(V)C*-. Any consonant could serve as a suffix.
    5. Primary (that is, non-derivational) noun stems displayed similar patterning, though, unlike verb stems, they were originally characterized by stable vocalism.

    As noted above, one of the most striking characteristics of the Semitic verb is the overwhelming preponderance of triconsonantal roots (C_1-C_2-C_3). Another salient characteristic is that the lexical meaning falls exclusively on the consonants. The vowels, on the other hand, alternate according to well-defined patterns that indicate specific inflectional, derivational, and syntactic functions. That is to say that the vowels have morphological rather than semantic significance. This alternation of vowels is technically known as “apophony”. The triconsonantal template and the apophonic alternations form a tightly integrated system. Cf. Del Olmo Lete 2003, 2007, and 2010.

    In the previous chapter (§17.5), it was suggested that the formative vowels may have been aspect markers. According to Zaborski, the patterning was as

follows: *a* marks present (imperfective), *i* ~ *e* mark past (perfective), and *u* ~ *o* mark subordinate. Thus, following Zaborski's views, the Proto-Afrasian active verb stems would have had the following patterning:

Imperfective aspect	**CVCaC-*
Perfective aspect	**CVCiC-*
Subordinate	**CVCuC-*

At this stage, the vowel of the first syllable was stable, while that of the second syllable changed as indicated above.

The innovation that led to the rise of apophony was the modification of the vowel of the first syllable to indicate different morphological functions in imitation of the patterning of the second syllable. A repercussion of the rise of apophony was the need to bring all verbal roots into conformity with the triconsonantal scheme, at the expense of other root types. The reason for this was that the emerging apophonic patterning could only function properly within the context of a fairly rigid structure. This system became so tightly integrated that it was, for all practical purposes, impervious to further change. Even to the present day, the verbal patterning is highly homologous among the Semitic daughter languages. These patterns may be illustrated by the Arabic verb *ḳatala* (root *ḳtl*) 'to kill, to slay, to murder' (table from Kaye 2007:217):

Form	Voice	Perfect	Imperfect	Imperative	Participle	Verbal Noun
I	Active	*ḳatala*	*yaḳtulu*	*uḳtul*	*ḳātil*	*ḳatl*, etc.
	Passive	*ḳutila*	*yuḳtalu*		*maḳtūl*	
II	Active	*ḳattala*	*yuḳattilu*	*ḳattil*	*muḳattil*	*taḳtīl*
	Passive	*ḳuttila*	*yuḳattalu*		*muḳattal*	
III	Active	*ḳātala*	*yuḳātilu*	*ḳātil*	*muḳātil*	*muḳātala*
	Passive	*ḳūtila*	*yuḳātalu*		*muḳātal*	
IV	Active	*ʔaḳtala*	*yuḳtilu*	*ʔaḳtil*	*muḳtil*	*ʔiḳtāl*
	Passive	*ʔuḳtila*	*yuḳtalu*		*muḳtal*	
V	Active	*taḳattala*	*yataḳattalu*	*taḳattal*	*mutaḳattil*	*taḳattul*
	Passive	*tuḳuttila*	*yutaḳattalu*		*mutaḳattal*	
VI	Active	*taḳātala*	*yutaḳātalu*	*taḳātal*	*mutaḳātil*	*taḳātul*
	Passive	*tuḳūtila*	*yutaḳātilu*		*mutaḳātal*	
VII	Active	*inḳatala*	*yanḳatilu*	*inḳatil*	*munḳatil*	*inḳitāl*
VIII	Active	*iḳtatala*	*yaḳtatilu*	*iḳtatil*	*muḳtatil*	*iḳtitāl*
	Passive	*uḳtutila*	*yuḳtatalu*		*muḳtatal*	
IX	Active	*iḳtalla*	*yaḳtallu*	*iḳtalil* ~ *iḳtalla*	*muḳtall*	*iḳtilāl*
X	Active	*istaḳtala*	*yastaḳtilu*	*istaḳtil*	*mustaḳtil*	*istiḳtāl*
	Passive	*ustuḳtila*	*yustaḳtalu*		*mustaḳtal*	

Notes:
1. The *hamzatu lwaṣl* ("eliding glottal stop") is not shown in the table.
2. Kaye writes /q/ instead of /ḳ/. The emphatics are written with an underdot in this book (/ṭ/, /ḳ/, /ṣ/, etc.) — they are pronounced as pharyngealized consonants in Arabic (see Chapter 7, §7.2).

For more information, cf. Diakonoff 1988:85—110; Kuryłowicz 1962; Rubio 2005; and A. K. Simpson 2009. Rössler 1981 is also of interest.

5. FROM PROTO-NOSTRATIC TO PROTO-AFRASIAN: Though significant progress has been made in reconstructing the Proto-Afrasian phonological system and vocabulary, Proto-Afrasian morphology has not yet been reconstructed. Nevertheless, it is possible to trace, in broad outline, some of the developments that may have occurred, though much still remains uncertain.

   Though Afrasian plays a critical role in the reconstruction of Proto-Nostratic morphology, there were many developments that occurred within Proto-Afrasian proper after it became separated from the rest of the Nostratic speech community. In this section, an attempt will be made to provide explanations for how some of the unique characteristics of Proto-Afrasian morphology may have come into being.

   A. GENDER AND CASE: Proto-Nostratic nouns did not distinguish gender, and Pre-Proto-Afrasian nouns must also have lacked this category. However, based upon the evidence of the Afrasian daughter languages, gender must be reconstructed as an inherent part of noun morphology in Proto-Afrasian proper (cf. Frajzingier 2012:522—523).

      Like Proto-Nostratic, Proto-Afrasian was most probably an active language. Two declensional types were inherited by Proto-Afrasian from Proto-Nostratic, each of which was distinguished by a special set of markers (see Chapter 17, §17.5):

      1. *-*u* was used to mark the subject in active constructions;
      2. *-*a* was used to mark:

         (a) The direct object of transitive verbs;
         (b) The subject in stative constructions;
         (c) The so-called "*status indeterminatus*".

      Note: As in Proto-Nostratic, the marker *-*i* indicated possession in Proto-Afrasian. It was preserved as such in Proto-Semitic (cf. Gragg—Hoberman 2012:170; Rubin 2010:36; Moscati 1964:94, §12.64; Weninger 2011a:165) and partially in Cushitic (cf. Appleyard 2011: 44—48) and Omotic (cf. Zaborski 1990:619—620).

Importantly, Sasse (1984:117) reconstructs the following two declensional paradigms for nouns with short final vowels for Proto-East Cushitic:

	Masculine	Feminine
Absolute Case	*-*a*	*-*a*
Subject Case	*-*u/i*	*-*a*

Note: The absolute case is not to be confused with the "absolutive" case of ergative languages. It is a translation of Italian *forma assoluta* first used by Moreno in 1935 (cf. Mous 2012:369).

Sasse notes:

> Regardless of whether the neutralization of the case forms in the feminine nouns was inherited from the proto-language (that is, case forms for feminines never developed) or represents a historical stage during the reduction of the case-marking system which was once more elaborate, it is obvious that the lack of subject-object distinction with feminine nouns can be explained in functional terms. It is well known that in addition to the semantic category of neutral sex which is of minor importance the Cushitic gender categories primarily denote the notions of social significance (masculine) vs. social insignificance (feminine)… Since the primary function of subject and object cases is the distinction of agent and patient nouns, it is clear that case marking is more important for those noun classes that are designated to denote items which normally occur on both agents and patients (i.e. animates, big and strong beings, etc.) than for those noun classes which do not (inanimates, insignificant things, etc.). There is an interesting parallel in Indo-European, where neuter nouns generally do not distinguish subject and object. The personal pronouns and the demonstratives are naturally excluded from this neutralization, because they are more likely to refer to animates.

Thus, the feminine case markers reconstructed for Proto-East Cushitic by Sasse are to be derived from the *-*a* found in the masculine absolute. The masculine case markers shown above represent the oldest patterning, and, inasmuch as there are traces of this patterning in Semitic and Berber, it must ultimately go back to Proto-Afrasian.

As the category of gender began to emerge in Afrasian, the individual daughter languages exploited other means to indicate the feminine, such as, for example, the formant *-*t*- (perhaps derived from the form preserved in Egyptian *ỉt* 'vulva, external female reproductive organs' [cf. Erman—Grapow 1926—1963.1:142]). For more information on how the category of gender is treated in the various branches of Afrasian, cf. especially D. Cohen (ed.) 1988 and Fajzyngier—Shay (eds.) 2012.

B. PRONOUNS: Proto-Afrasian had independent personal pronouns distinct from subject and object pronouns. The following independent personal pronouns may be reconstructed for Pre-Proto-Afrasian:

	Singular	Plural
1	*ʔ*V*-	**n*V*+Plural
2	**t*V*-	**t*V*+Plural
3	**s*V*-	**s*V*+Plural

Notes:

1. The first and second person forms were exactly as given above for the prefix conjugation personal prefixes, except that the third person prefix was based upon the stem **y*V*- (cf. Satzinger 2003:394). This is an important piece of information, for it allows us to ascertain what the most archaic forms of the personal pronouns may have been and to speculate about their later development.
2. In Omotic, the first person is built upon the stem **ta*- and the second upon the stem **ne*- (cf. Welaitta 1st sg. subject *ta-ni*, 2nd sg. subject *ne-ni*). Curiously, similar forms show up in Elamite in the possessive pronouns of the second series: 1st sg. *-ta*, 2nd sg. *-ni*.

It should be noted that the first person singular and plural were originally two distinct stems. The first innovation was the combining of the two first person stems into a new compound form (cf. Militarëv 2011:77):

	Singular	Plural
1	*ʔ*V*+*n*V*-	*ʔ*V*+*n*V*+Plural
2	**t*V*-	**t*V*+Plural
3	**s*V*-	**s*V*+Plural

Then, **ʔV*- was extended to the second and third person forms in imitation of the first person forms:

	Singular	Plural
1	*ʔ*V*+*n*V*-	*ʔ*V*+*n*V*+Plural
2	*ʔ*V*+*t*V*-	*ʔ*V*+*t*V*+Plural
3	*ʔ*V*+*s*V*-	*ʔ*V*+*s*V*+Plural

Next, **-n*- was angalogically inserted into the second person forms on the basis of the first person forms:

	Singular	Plural
1	*ʔ*V*+*n*V*-	*ʔ*V*+*n*V*+Plural
2	*ʔ*V*+*n*+*t*V*-	*ʔ*V*+*n*+*t*V*+Plural
3	*ʔ*V*+*s*V*-	*ʔ*V*+*s*V*+Plural

Finally, separate feminine third person forms were created, and *-*kV* was appended to the 1st person singular pronoun (cf. Akkadian *anāku* 'I'; Egyptian *i̯n-k* 'I' // Coptic *anok* [ⲁⲛⲟⲕ] 'I'; Moroccan Tamazight *nəkk* 'I').

No doubt, the changes described above occurred over a long period of time and may not have been fully completed by the time that the individual Afrasian daughter languages began to appear. Each daughter language, in turn, modified the inherited system in various ways (for Semitic developments, cf. Del Olmo Lete 1999; for Cushitic, cf. Appleyard 1986). Here are attested forms in select Afrasian daughter languages (only the singular and plural forms are given) (cf. Frajzyngier—Shay [eds.] 2012; Diakonoff 1988:72—73; Gardiner 1957:53; Lipiński 1997:298—299; Moscati 1964:102; Rubin 2004:457—459; R. Stempel 1999:82):

	Semitic: Arabic	Semitic: Akkadian	Egyptian	Berber: Tuareg	Cushitic: Rendille
Singular					
1	*ʔanā*	*anāku*	*i̯n-k*	*n-ək*	*an(i)*
2 (m.)	*ʔanta*	*atta*	*nt-k*	*kay*	*at(i)*
(f.)	*ʔanti*	*atti*	*nt-t̲*	*kəm*	*at(i)*
3 (m.)	*huwa*	*šū*	*nt-f*	*nt-a*	*us(u)*
(f.)	*hiya*	*šī*	*nt-s*	*nt-a*	*iče*
Plural					
1 (m.)	*naḥnu*	*nīnu*	*i̯n-n*	*n-əkkă-ni*	*inno*
(f.)	*naḥnu*	*nīnu*	*i̯n-n*	*n-əkkă-nəti*	*inno*
2 (m.)	*ʔantum(ū)*	*attunu*	*nt-t̲n*	*kăw-ni*	*atin*
(f.)	*ʔantunna*	*attina*	*nt-t̲n*	*kămă-ti*	*atin*
3 (m.)	*hum(ū)*	*šunu*	*nt-sn*	*əntă-ni*	*ičo*
(f.)	*hunna*	*šina*	*nt-sn*	*əntă-nəti*	*ičo*

C. CONJUGATION: Proto-Afrisian had two conjugations: (1) a prefix conjugation (active) and (2) a suffix conjugation (stative). The prefix conjugation became fixed early on in Proto-Afrasian, while the suffix conjugation was still very much a work in progress. Thus, the various daughter languages inherited a common prefix conjugation from Proto-Afrasian (except for Egyptian, which has no trace of the prefix conjugation [cf. Satzinger 2003:393]), while the suffix conjugations differed from branch to branch. The Proto-Afrasian personal prefixes were as follows (cf. Diakonoff 1988: 80; D. Cohen 1968:1309; Lipiński 1997:370—371; Satzinger 2003:394):

	Singular	Plural
1	**ʔV-*	**nV-*
2	**tV-*	**tV-*
3 (m.)	**yV-*	**yV-*
(f.)	**t-*	

Note: Masculine and feminine are not distinguished in the 3rd plural.

It is immediately obvious that these prefixes are based upon earlier Proto-Nostratic pronominal elements. Banti (2004:40) reconstructs a nearly identical set of forms for the Proto-Cushitic *suffix* conjugation (SC1):

	Singular	Plural
1	*Stem-*ʔV*	*Stem-*anV* (?)
2	*Stem-*tV*	*Stem-*tin*
3 (m.)	*Stem-*i*	*Stem-*in*
(f.)	*Stem-*tV*	

Notes:
1. The 2nd and 3rd plural forms contain the plural marker *-*n* (see Chapter 16, §16.26).
2. Masculine and feminine are not distinguished in the 3rd plural.

Compare the personal prefixes reconstructed for Proto-Semitic by Lipiński (1997:370) (singular and plural only) (see also Appleyard 1999:299):

	Singular	Plural
1	**ʔa-*	**ni-*
2 (m.)	**ta-*	**ti- … -ū*
2 (f.)	**ta- … -t*	**ti- … -ā*
3 (m.)	**ya-*	**yi- … -ū*
3 (f.)	**ta-*	**yi- … -ā*

The Beja / Beḍawye personal prefixes are (cf. Appleyard 2007a:467):

	Singular	Plural
1	*ʔa-, -Ø-*	*ni-, -n-*
2 (m.)	*ti-, Ø-, -t-+-`a*	*ti-, -t-+-`na*
2 (f.)	*ti-, Ø-, -t-+-`i*	
3 (m.)	*ʔi-, Ø-, -y-*	*ʔi-, -y-+-`n(a)*
3 (f.)	*ti-, Ø-, -t-*	

Note: Masculine and feminine are not distinguished in the 2nd and 3rd plural.

D. STATE: Proto-Semitic nouns had two distinct forms, depending upon their syntactic function (cf. Frajzingier 2012:533—534; Rubin 2010:38—40): (1) construct state (bound); and (2) free state (unbound) (additional states developed in the daughter languages). The construct state was used when a noun governed a following element. It had no special marker and was the unmarked form. The free state was used elsewhere and was the marked form. It was indicated by the markers *-*m(a)*/*-*n(a)*, which were appended after the case endings (cf. Rubin 2010:38—40). Ultimately, these markers had the same origin as the relational markers *-*ma* and *-*na*, which were originally used to mark the direct object of transitive verbs as well as the subject in stative constructions (see Chapter 17, §17.5; see also Michalove 2002a:94, note 2; Blažek 2014:28; Del Olmo Lete 2008). In Proto-Semitic, they were reinterpreted as markers of the free state.

18.3. ELAMITE

The following discussion is based mainly on Khačikjan 1998 — see also Grillot-Susini 1987, McAlpin 1981, Paper 1955, Reiner 1969, and Stolper 2004.

Like Proto-Dravidian, Elamite was an agglutinating language and strictly suffixal. According to Khačikjan (1998:11), roots consisted mostly of two consonants and one or two vowels: *CVC* (*nap* 'deity', *ruh* 'man', *kap* 'treasure', *kik* 'sky'), *CVCV* (*zana* 'lady'). It should be noted that the following root types were also found: *CV* (*da-* 'to place', *ki* 'one'), *VC* (*ap(i)* 'these' [animate plural]), and *CVCC-* (*sunk-i-* 'king'). Verb stems consisted either of a root ending in a vowel or of a root extended by a thematic vowel if the root ended in a consonant: *CV-* (rare), *CVC-V-*, or *CVCC-V-*. Thus, verb stems always ended in a vowel (cf. Khačikjan 1998:13; Reiner 1969:78; Grillot-Susini 1987:32). Derviational suffixes were added to these stems. Reduplication and compounding were also common.

Stems were formed from roots ending in a consonant plus a thematic vowel: *CVC(C)-V-*. The thematic vowels *-u* and *-a* were found only on verb stems, while *-i* was found both on noun and noun-verb stems (cf. Khačikjan 1998:11).

Adjectives did not constitute a separate grammatical class in Elamite. They were denoted by the personal class markers (see below) and postpositions.

According to Khačikjan (1998:11), nouns consisted of:

1. Roots ending in a consonant (*CVC*: *nap* 'god, deity', *ruh* 'man', *kap* 'treasure', *kik* 'sky') or a vowel (*CVCV*: *zana* 'lady').
2. Enlarged roots (*CVCC-V*: *kukk-i* 'vault, roof').
3. Stems followed by class markers (see below).
4. Stems followed by derivational suffixes (see below).
5. Compound stems followed by derivational suffixes.

There were two genders (animate and inanimate) and two numbers (singular and plural — the plural ending was *-p(e)*, *-(i)p*, *-pi*). There was also a series of animate and inanimate class markers, as follows (cf. Grillot-Susini 1987:13—14; Khačikjan 1998:12; Stolper 2004:73):

Animate:				
Singluar:	1st	-k	locutive	*sunki*-k ‘I, king’
	2nd	-t	allocutive	*hutta-n*-t ‘you, doing’; *katu-k*-t ‘you, living’
	3rd	-Ø	delocutive	*nap*[-Ø] ‘he, deity’; *zana*[-Ø] ‘she, lady’
		-r		*nap-i*-r ‘he, deity’; *sunki*-r ‘he, king’
Plural:	3rd	-p	delocutive	*nap-i*-p ‘they, deities’; *sunki*-p ‘they, kings’
Inanimate:				
Singular:	3rd	-Ø	delocutive	*hal*[-Ø] ‘town, land’; *mur*[-Ø] ‘place’
		-me		*sunki*-me ‘kingdom, kingship’
		-n		*siya*-n ‘temple’; *muru*-n ‘earth’
		-t		*hala*-t ‘clay, mud brick’

Notes:
1. The 3rd person inanimate class markers were derivational.
2. The animate class markers indicated agent nouns, members of a class, or persons.
3. The inanimate class marker *-me* indicated abstracts (see below).

There were no case endings on nouns. However, personal pronouns distinguished an object case denoted by the ending *-n* (*u*-n ‘me’, *nu*-n [sg.] ‘you’; *nuku*-n ‘us’, *numu*-n [pl.] ‘you’; etc.). Clearly, this is descended from the Proto-Nostratic direct object marker (*-*ma*/)*-*na* (see Chapter 17, §17.5). In Royal Achaemenid Elamite, there was a genitive ending *-na* (cf. Khačikjan 1998:16; Paper 1955:70—74). According to Khačikjan (1998:16), this ending was a combination of the neutral classifier *-ni* and the relative/connective particle *-a*. In Middle Elamite, *-ni* and *-a* were used separately to indicate possession (cf. Khačikjan 1998:16) — the class markers *-r*, *-me*, and *-p* were also used to indicate possession. No doubt, *-ni* is descended from the Proto-Nostratic possessive marker *-*nu* (cf. Chapter 16, §16.28, for details).

Next, Khačikjan (1998:12) lists the following derivational suffixes (see also Grillot-Susini 1987:14—15; McAlpin 1981:66—67):

1. *-r(a)* and its plural variant *-p(e)*:
   a. Formed personal nouns indicating a member of a group (*-ra*) or the group itself (*-pe*);
   b. Added to verbal stems, these suffixes formed actor nouns (for example, *liba-r* ‘servant’, *liba-p* ‘servants’);
   c. Added to toponyms, they were used to denote ethnic groups (for example, *hinduya-ra* ‘Indian’, *hinduš-pe* ‘Indians’ [< *Hinduš* ‘India’]);

d. These suffixes were also used with loanwords (for example, *kurtaš-ra* ‘worker’, *kurtaš-pe* ‘workers’);
e. Attributes with delocutive classifiers could be used as substantives (for example, *kat-ri* ‘lord, master’, literally, ‘(that) of the throne’).

2. *-me* (< Proto-Elamite *-*may*) was mostly used to form abstract nouns (for example, *sunki-me* ‘kingship, kingdom’, *liba-me* ‘service’, *tit-me* ‘tongue’).
3. *-t(e)* formed generalized nouns from nouns and nouns from adjectives (for example, *hal-te* ‘door’, *hala-t* ‘brick’).
4. *-um*, *-in*, *-am*, *-un*, *-n* formed neutral nouns with a weakly expressed abstract meaning, often connected with buildings or localities (for example, *bal-um* ‘storehouse’, etc.)
5. *-(a)š* was used for nonhumans. It formed words connected with agriculture, animal husbandry, or food terminology. It was common in place names, and it was also used with Old Persian loanwords.

The following postpositions were used to express spatial relationships. Though they functioned as case endings, they were, in fact, postpositions and not case endings.

Simple:

1.	Directive-Allative	*-ikki* ‘to, towards, into’
2.	Locative	*-ma* ‘in(to), on(to)’ (temporal and spatial)
3.	Superessive	*-ukku* ‘on, in, according to’
4.	Ablative-Separative	*-mar* ‘from, out of’ (temporal and spatial)

Compound:

5.	Ablative-Instrumental	*-ikki-mar* ‘from, by’ (with animates)
		-ma-mar- ‘from, near’ (with inanimates)

Elamite verbs had two aspects: perfective (past) and imperfective (non-past). The perfective aspect had two forms: (1) transitive and (2) intransitive. The imperfective aspect was used to express the present and future tenses, in addition to the oblique moods.

18.4. DRAVIDIAN

The following discussion is taken mostly from Krishnamurti 2003:179—204 — see also Andronov 2003:101—103; Caldwell 1913:196—204; Steever 1990. Proto-Dravidian roots (both verbal and nominal) were monosyllabic with the canonical shape *$(C_1)\breve{V}(C_2)$-, that is, two fundamental types: closed roots (ending in a consonant) and open roots (ending in a vowel, short or long). Extended stems were formed by the addition of the following suffixes to open roots: *-*C(V)*, *-*CC(V)*, or *-*CCC(V)*. If a root ended in a consonant (closed roots), a formative vowel (that is, *-*a*, *-*i*, or *-*u*) was added to the root as the first layer of suffixes. Additional suffixes in the forms *-*C-CC-* or *-*CCC-* could then be added after the vowel

suffix. When closed roots were used as free forms, the final consonant was doubled and a non-morphemic enunciative vowel was added. The enunciative vowel was lost before words beginning with a vowel (cf. Krishnamurti 2003:93). Note: Contrastive vowel length was a specific Proto-Dravidian development and was not inherited from Proto-Nostratic (cf. McAlpin 1974a:95). The variation in vowel length was originally governed by metrical considerations — thus, *$*(C_1)\bar{V}C_2$- (with long vowel) alternated with *$*(C_1)\check{V}C_2$-C_3- (with short vowel) as in *$*k\bar{a}\underline{n}$- 'to see' as opposed to *$*ka\underline{n}\underline{t}$- (cf. Steever 1990:179).

In the preceding chapter (§17.5), a series of *formative vowels* was posited for verb stems in Proto-Nostratic, and it was proposed that they may have been aspect markers: *$*a$* = imperfective aspect; *$*i$* = perfective aspect; and *$*u$* = subordinate. In Proto-Dravidian, the original meaning of the formative vowels was lost. According to Krishnamurti (2003:97), the formative vowels "apparently had an epenthetic role of splitting clusters without affecting the syllable weight …" Note the following examples given by Krishnamurti (2003:181):

1. *$*tir$-a-y*- (*$*-p$-/*$*-mp$-, *$*-nt$-) 'to roll (intr.)'; *$*tir$-a-y*- (*$*-pp$-/*$*-mpp$-, *$*-ntt$-) 'to roll up (tr.)', (n.) *$*tir$-a-y* 'wave, screen, curtain'; *$*tir$-a-nku* 'to be curled up (intr.)', *$*tir$-a-$nkku$* 'to shrivel (tr.)';
2. *$*tir$-a-\underline{l}$*- (*$*-p$-, *$*-\underline{n}\underline{t}$-) 'to become round (intr.)', *$*tir$-a-\underline{l}$*- (*$*-pp$-, *$*-\underline{n}\underline{t}\underline{t}$-) 'to make round (tr.)';
3. *$*tir$-i*- (*$*-p$-, *$*-nt$-) 'to turn (intr.)', *$*tir$-i*- (*$*-pp$-, *$*-ntt$-) 'to turn (tr.)'; *$*tir$-u-ku* 'to twist (intr.)', *$*tir$-u-kku* 'to twist (tr.)'; *$*tir$-u-mpu* 'to twist, to turn (intr.)', *$*tir$-u-$mppu$* 'to twist, to turn (tr.)';
4. *$*tir$-u-ntu* 'to be corrected, to be repaired (intr.)', *$*tir$-u-$nttu$* 'to correct, to rectify (tr.)'.

As stated by Krishnamurti (2003:181), "[t]he Proto-Dravidian root is obviously *$*tir$-, meaning 'turn, roll, twist, change shape' → 'correct', etc. The formatives occur in two layers. The first layer is V = *$*i$*, *$*a$*, *$*u$*; and the second layer, either a sonorant (L) as in *$*y$*, *$*\underline{l}$*; or a simple or geminated stop ± homorganic nasal: P as in *$*ku$*; PP as in *$*kku$*; NP as in *$*nku$*, *$*ntu$*, *$*mpu$*; NPP as in *$*nkku$*, *$*nttu$*, *$*mppu$*." Thus, the overall structure was as follows:

Root + formative vowel (*a, *i, *u) + resonant (*y, *w, *l/$\underline{l}$, *r/$\underline{r}$)
or simple or geminated stop ± homorganic nasal

Inflectional suffixes followed derivational suffixes, thus: root + derivational suffix + inflectional suffix (cf. Steever 1990:179). Roots ending in a vowel were followed by derivational suffixes beginning with a consonant, while roots ending in a consonant could be followed by derivational suffixes beginning with either a consonant or a vowel, though those beginning with a vowel were by far the most common type. Derivational suffixes beginning with a vowel could consist of (A) the simple vowel itself (*-*V*-), (B) the vowel plus a single consonant (*-*VC*-), (C) the vowel plus a geminate stop (*-*VCC*-), (D) the vowel plus the sequence of nasal

and its corresponding homorganic stop (*-*VNC*-), or (E) the vowel plus the sequence of a nasal and its corresponding homorganic geminate stop (*-*VNCC*-). In primary nominal stems, the derivational suffix *-*VCC*- could be further extended by adding another suffix of the type *-*VC*-. The derivational suffixes probably originally modified the meaning in some way, though, as noted by Caldwell (1913:209), it is no longer possible, in most cases, to discern their original meaning.

It should be noted that deverbative nouns also occurred, such as **tir-a-y* 'wave, screen, curtain', cited above (> Malayalam *tira* 'wave, billow, curtain'; Tamil *tirai* 'wrinkle [as in the skin through age], curtain [as rolled up], wave, billow, ripple'; Kannaḍa *tere* 'wave, billow, curtain'; Koḍagu *tere* 'wave, dress, screen'; Telugu *tera* 'screen, curtain, wave'; etc. [cf. Burrow—Emeneau 1984:281, no. 3244]). From the stem **tir-i-*, there are: Tamil *tirikai* 'roaming, wandering, potter's wheel', *tiripu* 'change, alternation'; etc. (cf. Burrow—Emeneau 1984:282—283, no. 3246). And from **tir-u-*, there are: Tamil *tiruttam* 'correction, repair, improvement, amendment, orderliness, regularity, exactness', *tiruttal* 'correctness (as of writing)'; etc. (cf. Burrow—Emeneau 1984:283, no. 3251).

Krishnamurti (2003:181—184) further notes the important distinction made in Proto-Dravidian between transitive and intransitive verbs. This distinction was encoded in a series of suffixes (cf. Krishnamurti 2003:182). The development of the system marking this distinction occurred in stages within Proto-Dravidian. The first stage involved the addition of the suffixes *-*l*, *-*ḷ*, *-*r*, *-*ṟ* (Krishnamurti writes *-*ẓ*), *-*w*, *-*y* onto **(C)V̄*- or **(C)VC-V*-stems to form extended intransitive/middle voice stems. Next, a series of suffixes was added. These suffixes encode both tense and voice as well as the distinction between intransive and transitive — they are as follows:

	Non-past		Past
Intransitive	*p	*k	*t
	*mp	*nk	*nt
Transitive	*pp	*kk	*tt
	*mpp	*nkk	*ntt

Notes:

1. These suffixes were modified in various ways in the Dravidian daughter languages (cf. Krishnamurti 2003:197—199).
2. The non-past paradigms include present, future, aorist (habitual), infinitive, imperative, negative, etc. (cf. Krishnamurti 2003:182).
3. In the daughter languages, the tense meaning was lost, and the above suffixes only encode a voice distinction (cf. Krishnamurti 2003:182—183).

The next stage involved the addition of different auxiliary verbs to nonfinite forms of the main verb. Krishnamurti (2003:184—197) supports the above theories with a set of case studies.

Krishnamurti (2003:199—200) also lists and discusses various deverbative noun affixes. These include:

1. Addition of the suffix *-*ay* to monosyllabic verb roots.
2. Gemination of the final stop of the root in disyllabic stems or the formative in stems consisting of two or more syllables, as in **āṭṭ-am* 'game, dancing', **āṭṭu* 'playing, a game' < **āṭu* 'to play'.
3. Addition of the suffix *-*al* to verb roots.
4. Addition of *-*t-al* ~ *-*tt-al* (also *-*t-am*) to roots ending in *-*ṭ*.
5. Gemination of the post-nasal stop of a formative suffix in stems of two or more syllables.
6. Lengthening of the root vowel.
7. Addition of *-*am* to an intransitive or transitive verb stem.
8. Addition of multiple noun formatives: (1) *-*am*+*t*+*am* > *-*antam*; (2) *-*t* + **al*+*ay* > *-*talay*.
9. Addition of *-*(i)kay*.
10. Addition of *-*(i)kk-ay*.

Krishnamurti (2003:200—204) ends his discussion of Dravidian word formation with the following types of compounds: (1) verb + verb (2003:201); (2) noun + noun (2003:201—202); (3) adjective + noun (2003:202—203); (4) verb + noun (2003:203—204); and (5) compounds with doubtful composition (2003:204). For a complete list of grammatical markers in Dravidian, cf. Krishnamurti 2003:532—533. For somewhat different views on Dravidian word formation, cf. Andronov 2013:115—119; see also Steever 1998a:18—26.

18.5. KARTVELIAN

This section is repeated, in part, from Chapter 6, §6.4. Comparison of Proto-Kartvelian with other Nostratic languages, especially Proto-Indo-European and Proto-Afrasian, makes it seem probable that the root structure patterning developed as follows (cf. Aronson 1997:938):

1. There were no initial vowels in the earliest form of Pre-Proto-Kartvelian. Therefore, every root began with a consonant. (At a later stage of development, however, loss of laryngeals resulted in roots with initial vowels: **HVC*- > **VC*-. Similar developments occurred in later Proto-Indo-European.)
2. Though originally not permitted, later changes led to the development of initial consonant clusters.
3. Two basic syllable types existed: (A) open syllables (**V* and **CV*) and (B) closed syllables (**VC* and **CVC*). Permissible root forms coincided exactly with these two syllable types. Loss of laryngeals and vowel syncope in early Proto-Kartvelian led to new roots in the form **C*-.

4. A verbal stem could either be identical with a root or it could consist of a root plus a single derivational morpheme added as a suffix to the root: **CVC-VC-*. Any consonant could serve as a suffix. (Inflectional endings could be of the form **-V*, as in the case of the 3rd singular aorist ending **-a.*)
5. Similar patterns occurred in nominal stems.

At this time, there were three fundamental stem types: (A) verbal stems, (B) nominal and adjectival stems, and (C) pronominal and indeclinable stems. That this distinction remained in Proto-Kartvelian proper is shown by the fact that prefixes mostly maintained their original structural identify, being only partially involved in the system of vowel gradation (cf. Gamkrelidze 1967:715) as well as by the fact that nominal stems were sharply distinguished from verbal stems in that they had the same ablaut state throughout the paradigm, while extended (that is, bimorphemic) verbal stems had alternating ablaut states according to the paradigmatic pattern (cf. Gamkrelidze 1967:714—715).

The phonemicization of a strong stress accent in Early Proto-Kartvelian disrupted the patterning outlined above. The positioning of the stress was morphologically distinctive, serving as a means to differentiate grammatical categories. All vowels were retained when stressed but were either weakened (= "reduced-grade") or totally eliminated altogether (= "zero-grade") when unstressed: the choice between the reduced-grade versus the zero-grade depended upon the position of the unstressed syllable relative to the stressed syllable as well as upon the laws of syllabicity in effect at that time. Finally, it was at the end of this stage of development that the syllabic allophones of the resonants came into being and possibly the introvertive harmonic consonant clusters as well. These alternations are discussed in detail in Gamkrelidze—Mačavariani 1982 and Tuite 2017 — see also Harris 1985. It was probably at this time that the complex consonant clusters came into being.

The stress-conditioned ablaut alternations gave rise to two distinct forms of extended stems:

State 1: Root in full-grade and accented, suffix in zero-grade: *$C_1\acute{V}C_2$-C_3-.
State 2: Root in zero-grade, suffix in full-grade and accented: *C_1C_2-$\acute{V}C_3$-.

These alternating patterns, which characterize the bimorphemic verbal stems, may be illustrated by the following examples (cf. Gamkrelidze 1966:74 and 1967:714):

State 1 (Intransitive)	State 2 (Transitive)
**der-k'-* 'to bend, to stoop'	**dr-ek'-* 'to bend'
**šker-t'-* 'to go out'	**škr-et'-* 'to extinguish'
**k'er-b-* 'to gather'	**k'r-eb-* 'to collect'

When a full-grade suffix was added to such stems, the preceding full-grade vowel was replaced by either reduced-grade or zero-grade:

State 1	State 2
**der-k'-* > **dr̥-k'-a*	**dr-ek'-* > **dr-ik'-e*
**šker-t'-* > **škr̥-t'-a*	**škr-et'-* > **škr-it'-e*
**k'er-b-* > **k'r̥-b-a*	**k'r-eb-* > **k'r-ib-e*

Nominal stems also displayed these patterns, though, unlike the bimorphemic verbal stems, the same ablaut state was fixed throughout the paradigm (cf. Gamkrelidze 1967:714):

State 1	State 2
**šax-l̥-* 'house'	**km-ar-* 'husband'
**ǯaγ-l̥-* 'dog'	**cm-el-* 'fat'
**k'wen-r̥-* 'marten'	**ǯm-ar-* 'vinegar'

Morphologically, the Kartvelian languages are all highly inflected; Georgian, for example, has six basic grammatical cases as well as eleven secondary cases. A notable characteristic of noun declension is the distinction of ergative and absolutive cases; the ergative case is used to mark the subject of transitive verbs, while the absolutive case is used to mark direct objects and the subject of intransitive verbs. It is the dative case, however, that is used to mark the subject of so-called "inverted verbs". There are several other departures from canonical ergative-type constructions, so much so in Mingrelian, for instance, that this language no longer possesses any true ergative features. Adjectives normally precede the nouns they modify. Postpositions are the rule. Very important, and fully in agreement with the views expressed in this book, is the fact that Tuite (2017: 10—12) reconstructs stative-active alignment for the earliest phase of Proto-Kartvelian. (Nichols 1992:101 classifies Georgian as a stative-active language.)

Kartvelian verb morphology is particularly complicated — for example, Tuite (2004:978—981) lists thirteen distinctive functional elements that may be arrayed around a given verb root in Early Georgian, though they may not all appear simultaneously (Fähnrich 1994:78 lists twenty-three elements, including the root; Boeder 2005:22 lists sixteen elements for Modern Georgian); the overall scheme is as follows:

1. Preverb with more or less predictable directional meaning
2. Preverb *mo-* ('hither')
3. Preverbial clitic
4. Morphological object prefix
5. Morphological subject prefix
6. Character or version vowel (German *Charaktervokal*)

   ROOT

7. Passive/inchoative or causative suffix

8. Plural absolutive suffix
9. Series marker (or "present/future stem formant")
10. Imperfect stem suffix
11. Tense/mood vowel
12. Person/number suffix
13. Postposed clitics

This patterning can be reconstructed for Proto-Kartvelian as well. Specifically, Tuite (2017:2) notes that the core slots in Proto-Kartvelian verb structure include the root and a chain of suffixical morphemes of the shape -*VC*-. Lexically-specified elements are closest to the root, while productive derivational morphemes (such as causative and inchoative suffixes) are toward the middle, and inflectional elements are to the right. Tuite states that the verb suffixes originated as -*VC*- formants used to modify the Aktionsart ("lexical aspect"), aspect, or valence of the root.

The inflectional slots come next and include a character or version vowel to the left of the root — it is used to mark the relationship between the verb and its arguments (cf. Boeder 2005:34—38 for a discussion of the role of the character or version vowel; see also Rostovtsev-Popiel 2014). Next come the imperfect suffix and tense/aspect/mood suffix to the right of the root. A little further out are the subject and object prefixes to the left of the root and a suffix to the right indicating the plurality of the 1st and 2nd person grammatical subject.

The outermost slots include morphemes which appear to have originated as clitics. Tuite (2017:15) appends a rather helpful chart summarizing the structure of the Kartvelian verb.

Tuite (2017:12—13) summarizes his views on the structure of the verb in early Proto-Kartvelian as follows:

> The early Kartvelian verb would have consisted in a verbal root optionally followed by a chain of /VC/ morphemes (modifying the Aktionsart or other semantic features of the root), surrounded by inflectional prefixes and suffixes. Only 1st- and 2nd-person core arguments would have governed agreement affixes in the verb; the paired singular and plural 3rd-person suffixes found in Georgian and Laz-Mingrleian took on those functions after Svan separated from the ancestral speech community.
>
> On either side of the Proto-Kartvelian verb stem, and in the root itself, vowels contrasted with each other in paradigmatic sets. All four Kartvelian languages have a four-way contrast among preradical vowels (PRV), with strongly similar functions, which specialists have related to the categories of "version", voice, valence or applicativity… A contrasting set of three vowels in the suffixal slot after the verb stem indicated past tense, subjunctive mood, and possibly iterative or permansive aspect (TAM). As for the Kartvelian verb root, it is likely that more than one grammatical category was signaled by vowel contrasts. In addition to the /a/ ~ /e/ alternation in the active-inactive verb-stem pairs discussed in this paper, the /i/ vocalism marking statives derived from theme-centered verbs also appears to be old in Kartvelian.

The structure of nouns in Modern Georgian is relatively simple: stem + plural + case + postposition. Modern Georgian has seven cases: nominative, ergative, dative, genitive, instrumental, adverbial, and vocative (Cherchi 1999:5—8; Fähnrich 1993:46—53). The dative also functions as the object case. Morevoer, in addition to the basic grammatical cases listed above, there are eleven secondary cases. Old Georgian had an absolutive case as well — Fähnrich (1982:35) lists nine grammatical cases for Old Georgian. For Modern Svan, Tuite (1997:15) lists eight declension classes and six cases: nominative, dative, instrumental, adverbial, ergative, and genitive.

Kartvelian derivational morphology is rather complex and includes a large variety of prefixes and suffixes (for Georgian, cf. Fähnrich 1993:32—46). Rather long chains of such prefixes and suffixes are possible. Though Kartvelian verbs make use of both prefixes and suffixes, nouns, pronouns, and adjectives tend to prefer suffixes — prefixes are extremely rare. In early and medieval Georgian and Svan, preverbs were separable prefixes, and this was, undoubtedly, the situation in Proto-Kartvelian as well. Various types of compounds, as well as reduplication, are also common. Cf. Boeder 2005:42—47 for a synopsis of derivational morphology in the Kartvelian daughter languages.

Klimov (1964 and 1998) lists the following derivational affixes for Proto-Kartvelian (the transcription has been changed to conform with what is used in this book) (see also Fähnrich—Sardschweladse 1995; Fähnrich 2007):

Affix	Meaning
*a-	Verb prefix of causative
*-a	Suffix of deverbative action noun
*a-	Verb character (version) vowel
*-a	Subjective suffix
*-ad	Affix of adverbial derivation
*a- … -en/-in	Circumfix of the causative verbs
*-am : *-m	Verb thematic suffix
*ga(n)-	Preverb of directon: ‘outside, outwards’
*gw-	Objective prefix
*-d	Verb suffix
*-d	Passive suffix
*-d	Subjective suffix
*-da	Clitic of condition
*da-	Preverb of direction: ‘down(wards) on surface’
*e-	Verb character (version) vowel
*-e	Conjunctive suffix
*-eb	Verb thematic suffix
*-eb	Plural suffix
*-ed : *-id	Verb extension
*-et	Toponymic suffix
*-et	Verb extension
*-ek’ : *-(i)k’	Verb extension

*-el	Affix of noun derivation
*-en : *-in	Derivatory suffix of causative verbs
*-es : *-(i)s	Verb extension
*-ex : *-ix	Verb extension
*-wn	Stem-forming enlargement
*i-	Subjective prefix
*i-	Objective prefix
*-ia	Diminutive suffix on substantives
*-ik’	Diminutive affix
*-il	Affix producing participles
*-il	Affix producing deverbative nouns
*-(i)s	Topoformative element
*-iš-eul-	Affix producing adjectives of similarity
*m-	Word-formation prefix (Georgian *m-* participial prefix)
*m- … -e	Word-forming circumfix
*m- … -el	Word-forming circumfix
*ma-	Word-forming prefix (found mainly on present participles)
*me-	Word-forming prefix
*me- … -al	Word-forming circumfix
*me- … -e	Word-forming circumfix
*mi-	Preverb of direction: ‘aside from the speaker’
*mo-	Preverb of direction: ‘in the direction towards the speaker’
*na-	Word-forming prefix of the past participle
*ne-	Word-forming prefix
*ni-	Word-forming previx
*(s)a-	Word-forming prefix
*(s)i-	Word-forming prefix
*u-	Verb character vowel
*u-	Derivational prefix of participles
*-u	Derivational suffix of pejoratives
*u- … -eš	Derivational circumfix of elative (in adjectives)
*-un	Suffix of causative verbs
*c’ar-	Preverb of direction: ‘down, away, off’

18.6. INDO-EUROPEAN

18.6.1. ROOT STRUCTURE PATTERNING

In this section, we will be particularly concerned with tracing the most ancient patterning (see Chapter 20 of this book for more information).

Comparison of Proto-Indo-European with the other Nostratic daughter languages, especially Proto-Kartvelian and Proto-Afrasian, allows us to refine

Benveniste's theories concerning Proto-Indo-European root structure patterning (cf. Benveniste 1935:170—171; see also Lehmann 1952:17—18 and 2002:141—142). The most ancient patterning was probably as follows:

1. There were no initial vowels in the earliest form of Pre-Proto-Indo-European. Therefore, every root began with a consonant.
2. Originally, there were no initial consonant clusters either. Consequently, every root began with one and only one consonant.
3. Two basic syllable types existed: (A) **C*$_1$*V* and (B) **C*$_1$*VC*$_2$, where *C* = any non-syllabic and *V* = any vowel. Permissible root forms coincided exactly with these two syllable types.
4. A verb stem could either be identical with a root or it could consist of a root plus a single derivational morpheme added as a suffix to the root, as follows: **C*$_1$*VC*$_2$-*VC*$_3$-. Any consonant could serve as a suffix.
5. Nominal stems, on the other hand, could be further extended by additional suffixes.

In the earliest form of Proto-Indo-European, there were three fundamental stem types: (A) verbal stems, (B) nominal and adjectival stems, and (C) pronominal and indeclinable stems.

The phonemicization of a strong stress accent during the Phonemic Stress Stage of Proto-Indo-European disrupted the root structure patterning outlined above. The positioning of the stress was morphologically distinctive, serving as a means to differentiate grammatical categories. All vowels were retained when stressed but were either weakened (= "reduced-grade") or totally eliminated altogether (= "zero-grade") when unstressed: the choice between the reduced-grade versus the zero-grade depended upon the position of the unstressed syllable relative to the stressed syllable as well as upon the laws of syllabicity in effect at that time. During the Phonemic Stress Stage of development, the basic rule was that only one full-grade vowel could occur in any polymorphemic form. Finally, it was at the end of this stage of development that the syllabic allophones of the resonants came into being.

Roots were monosyllabic and consisted of the root vowel between two consonants (cf. Benveniste 1935:170; Lehmann 2002:141): **C*$_1$*VC*$_2$-. Unextended roots could be used as stems (also called "bases" or "themes") by themselves (when used as nominal stems, they are known as "root nouns"), that is to say that they could function as words in the full sense of the term (cf. Burrow 1973:118; Lehmann 2002:142), or they could be further extended by means of suffixes.

The stress-conditioned ablaut alternations gave rise to two distinct forms of extended stems:

Type 1: Root in full-grade and accented, suffix in zero-grade: *C$_1$V́C$_2$-C$_3$-.
Type 2: Root in zero-grade, suffix in full-grade and accented: *C$_1$C$_2$-V́C$_3$-.

When used as a verb stem, Type 1 could undergo no further extension. However, Type 2 could be further extended by another suffix on the pattern *C_1C_2-$\acute{V}C_3$-C_4-, or *-*n*- could be infixed after the root and before the suffix, as follows: *C_1C_2-*n*-$\acute{V}C_3$- (cf. Lehmann 1952:17—18 and 2002:142). Further addition of a determinative or suffixes pointed to a nominal stem (cf. Benveniste 1935:171; Lehmann 1952:17). In keeping with the rule that only one full-grade vowel could occur in any polymorphemic form, when a full-grade suffix was added to any stem, whether unextended or extended, the preceding full-grade vowel was replaced by either reduced-grade or zero-grade. We should note that this rule was no longer in effect in the Phonemic Pitch Stage of Proto-Indo-European. During the Phonemic Pitch Stage, many of these reduced-grade or zero-grade vowels were analogically replaced by full-grade vowels. Fortunately, enough traces of the earlier system remain in the early dialects, especially Sanskrit, that it is possible to reconstruct the original patterning.

Proto-Indo-European had the following root structure constraints:

1. When two non-glottalics appeared in a given root, they had to agree in voicing. A rule of progressive voicing assimilation may be set up to account for the elimination of roots whose consonantal elements originally did not agree in voicing: *T ~ *B → *T ~ *P, *B ~ *T → *B ~ *D, etc.
2. Two glottalics could not co-occur in a given root. A rule of regressive deglottalization may be set up to account for the elimination of roots containing two glottalics: *$C'VC'$- > *CVC'-.

18.6.2. THE FORMATION OF NOUNS

This section is condensed from Chapter 20, §20.6. Disintegrating Indo-European distinguished a great many derivational suffixes, and these are described in detail in the traditional comparative grammars of Brugmann—Delbrück, Hirt, Meillet, and Meier—Brügger, among others. By far, the most common types were those ending in the thematic vowel *-*e/o*-, which could be added either directly to the undifferentiated root or to the root extended by one or more suffixes. The majority of these suffixes were not ancient, and it is possible to trace how the system was built up over time. It is clear, for example, that the thematic suffixes proliferated during the Disintegrating Indo-European period at the expense of other types (cf. Burrow 1973:122; Lehmann 2002:143) — thematic stems were rare in Hittite (cf. Sturtevant 1951:79, §114; Burrow 1973:120). The overall structure was as follows: root + suffix (one or more) + inflectional ending.

In Chapter 17, §17.4, we discussed the root structure patterning of the Nostratic parent language. Roots had the shape *C_1VC_2-. We saw that a stem could either be identical with a root or it could consist of a root plus a single derivational morpheme added as a suffix to the root: *C_1VC_2+C_3-. Any consonant could serve as a suffix. This was the patterning inherited by Pre-Proto-Indo-European, which means that the earliest suffixes predate the appearance of Proto-Indo-European proper as a distinct language. This is an important point.

It is not possible to discern any distinction in meaning or function in the suffixes that were inherited by Proto-Indo-European from Proto-Nostratic. However, the newer suffixes that arose within Proto-Indo-European proper were most likely assigned specific meanings or functions. During the course of its development, Proto-Indo-European continued to create new lexical items, with the result that the original meaning or function of suffixes that had been created in Proto-Indo-European at earlier stages were mostly obscured by later developments. By the time the Disintegrating Indo-European period had been reached, the number of productive suffixes in use had grown considerably (see below).

During both the Phonemic Stress Stage and the Phonemic Pitch Stage of Proto-Indo-European, accentuation played a prominent role in nominal derivation, as noted by Burrow (1973:119—120):

> The most important distinction in nominal derivation in early Indo-European was not between the different suffixes simple or compound, but in a difference of accentuation according to which a word formed with the same suffix functioned either as an action noun or agent noun/adjective. Accented on the root it was an action noun and neuter, accented on the suffix it was an agent noun or adjective and originally of the co-called 'common gender'. The system is preserved to some extent in Sanskrit and is exemplified by such doublets as *bráhma* n. 'prayer' : *brahmā́* m. 'priest', *yáśas* n. 'glory' : *yaśás-* m. 'glorious'. The Sanskrit examples are not very numerous, and are only found in the case of a small number of suffixes; they are in fact the last remnants of a system dying out. In earlier Indo-European on the other hand the system was of very great extension and importance, and it is fundamental to the understanding not only of the formation of nouns but also of their declension.

According to Burrow, the rules governing the position of the accent may be stated as follows:

1. Neuter action nouns were accented on the stem in the so-called "strong" cases but on the ending in the so-called "weak" cases (cf. Burrow 1973:220—226).
2. Common gender agent noun/adjectives were accented on the suffix throughout the paradigm (cf. Burrow 1973:119).
3. Athematic verbs were accented on the stem in the singular but on the ending in the plural (and, later, in the dual as well) in the indicative but on the ending throughout the middle (cf. Burrow 1973:303).

This fairly simple system was replaced by a more elaborate one during the Disintegrating Proto-Indo-European period (note: Lundquist—Yates 2018 use the term "Proto-Nuclear Indo-European" [PNIE] for this period of development). For Disintegrating Proto-Indo-European, Fortson (2010:119—122) recognizes four distinct types of athematic stems, determined by the position of the accent as well as the position of the full-grade (or lengthened-grade) vowel (Fortson notes that additional types developed in individual daughter languages) (see also Watkins 1998:61—62; Beekes 1985:1 and 1995:174—176):

1. Acrostatic: fixed accent on the stem throughout the paradigm, but with ablaut changes between the strong and weak cases.
2. Proterokinetic (or proterodynamic): the stem is accented and in full-grade vowel in the strong cases, but both accent and full-grade vowel are shifted to the suffix in the weak cases.
3. Amphikinetic (or holokinetic or amphidynamic): the stem is accented in the strong cases, while the case ending is accented in the weak cases. Typically, the suffix is characterized by a lengthened *o*-grade vowel in the nominative singular and a short *o*-grade vowel in the accusative singular.
4. Hysterokinetic (or hysterodynamic): the suffix is accented in the strong cases, and the case ending in the weak cases.

Szemerényi (1996:162) adds a fifth type:

5. Mesostatic: the accent is on the suffix throughout the paradigm.

The thematic formations require special comment. It seems that thematic agent noun/adjectives were originally accented on the ending in the strong cases and on the stem in the weak cases. This pattern is the exact opposite of what is found in the neuter action nouns. The original form of the nominative singular consisted of the accented thematic vowel alone, **-é/ó*. It is this ending that is still found in the vocative singular in the daughter languages and in relic forms such as the word for the number 'five', **pʰenkʷʰe* (**peɘqᵘe* in Brugmann's transcription [cf. Sanskrit *páñca*, Greek πέντε]), perhaps for earlier **pʰn̥kʷʰé*. The nominative singular in **-os* is a later formation and has the same origin as the genitive singular (cf. Szemerényi 1972a:156).

Benveniste (1935:174—187) devotes considerable attention to describing the origin of the most ancient nominal formations. He identifies the basic principles of nominal derivation, thus: An adjective such as Sanskrit *pṛthú-* 'broad, wide, large, great, numerous' is based upon a root **pʰel-* 'to stretch, to extend' (Benveniste writes **pel-*), suffixed by the laryngeal **H* (Benveniste writes **-ə-*) found in Hittite *pal-ḫi-iš* 'broad'. Adding the suffix **-tʰ-* to the root yields two alternating stem types: type 1: **pʰél-tʰ-*, type 2: **pʰl-étʰ-* (Benveniste writes **pél-t-* and **pl-ét-* respectively). Next, the laryngeal determinative **-H_2-* (Benveniste writes **-$ə_2$-*) is added to type 2, followed by **-ú-* (Benveniste writes *-éu-*). The addition of the accented **-ú-* results in the loss of the stem vowel: **pʰl̥tʰH_2ú-* (Benveniste writes **pl̥tə$_2$éu-*) (> Sanskrit *pṛthú-ḥ* 'broad, wide, large, great, numerous', Greek πλατύς 'wide, broad'). Benveniste then illustrates these principles with further examples.

18.6.3. SUMMARY / EARLIER STAGES OF DEVELOPMENT

Proto-Indo-European had a long and complex developmental history. Pre-Proto-Indo-European began as a branch of Eurasiatic, itself a branch of Nostratic. Most likely, it took shape on the Eurasian steppes to the north and east of the Caspian Sea. Its closest relatives at the time were Uralic and Altaic (cf. Greenberg 2000—

2002; Kortlandt 2010a [various papers]), with which it was in close geographical proximity. Gradually, its speakers migrated westward, reaching the shores of the Black Sea around 5,000 BCE (see Chapter 13, §13.2). There, they encountered early Caucasian languages (see Chapter 21 for details). That contact brought about profound changes in the phonology and morphology of Pre-Proto-Indo-European, eventually producing the proto-language reconstructed in the standard handbooks through a direct comparison of the attested daughter languages.

As shown by Lehmann (1995 and 2002), among others, there is persuasive evidence that Pre-Proto-Indo-European was an active-type language (see Chapter 20 of this book for details). The root structure patterning outlined above (§18.6.1) may be assigned to Pre-Proto-Indo-European and to early Proto-Indo-European. The history of Proto-Indo-European proper began with the phonemicization of a strong stress accent (see above). That change initiated the restructuring of the inherited vowel system, including the development of syllabic variants of the resonants in unaccented syllables: *CVRCV́ > *CəRCV́ > *CR̥CV́ (see Chapter 4, §4.7). The restructuring of the vowel system was a lengthy, on-going process which continued throughout the history of Proto-Indo-European (that development is traced in Chapter 4). In part, through the normal process of language change over time and, in part, through contact with Caucasian languages, the morphology was also restructured. New case forms began to appear — some developed as a result of language contact (see Chapter 21), some developed from earlier forms that were assigned new functions, while others, such as the dual and plural endings in *-*bʰi*- and *-*mo*-, developed from earlier particles (cf. Blažek 2014; Lehmann 2002:146—150; R. Kim 2012). At the same time, new derivational elements began to appear in abundance, including preverbs. For more information, cf. Chapter 20, §20.10.

18.6.4. DERVIATIONAL SUFFIXES IN LATE PROTO-INDO-EUROPEAN

Regrettably, there is no comprehensive modern treatment of Proto-Indo-European derivational morphology (though there is a valuable synopsis in Lundquist—Yates 2018:2106—2113; see also Meier-Brügger 2010:321—373, 416—436). Therefore, the following list summarizes what is found in Brugmann—Delbrück (1897—1916, vol. II/1 [1906]) and Brugmann (1904:311—354, summary 353—354, §433):

Derivational Suffixes	Brugmann—Delbrück	Function
*-e/o-	(*-e/o-)	Masculine/neuter nouns/adjectives
-eA- [-aA-] (> *-ā-)	(*-ā-)	Feminine nouns/adjectives
*-tʰ(u)w-o-	(*-t(u)u̯-o-)	Masculine/neuter adjectives
*-tʰ(u)w-eA-	(*-t(u)u̯-ā-)	Feminine adjectives
-tʰr-o-/-tʰl-o-	(*-tr-o-/*-tl-o-)	Masculine/neuter: instrument or place of action
-tʰr-eA-/-tʰl-eA-	(*-tr-ā-/*-tl-ā-)	Feminine: instrument or place of action
*-(i)yo-	(*-(i)i̯o-)	Masculine/neuter nouns/adjectives

*-(i)yeA-	(*-(i)i̯ā-)	Feminine nouns/adjectives
*-(u)wo-	(*-(u)u̯o-)	Masculine/neuter nouns/adjectives
*-(u)weA-	(*-(u)u̯ā-)	Feminine nouns/adjectives
*-(n̥)no-	(*-(n̥)no-)	Masculine/neuter deverbative nouns/adjectives
*-(n̥)neA-	(*-(n̥)nā-)	Feminine deverbative nouns/adjectives
*-eno-	(*-eno-)	Masculine/neuter participles and abstract nouns
*-eneA-	(*-enā-)	Feminine participles and abstract nouns
-i(H)no-/-Vyno-	(*-ĭno-/*-a^{x}i̯no-)	Masculine/neuter secondary adjectives
-i(H)neA-/-VyneA-	(*-ĭnā-/*-a^{x}i̯nā-)	Feminine secondary adjectives
*-t^{h}(n̥)no-	(*-t(n̥)no-)	Masculine/neuter adjectives formed from adverbs of time
*-t^{h}(n̥)neA-	(*-t(n̥)nā-)	Feminine adjectives formed from adverbs of time
*-m(n̥)no-/*me/ono-	(*-m(n̥)no-/ *me/ono-)	Masculine/neuter middle (passive) participles from tense stems ending in the thematic vowel (*-e/o-)
*-m(n̥)neA-/*me/oneA-	(*-m(n̥)nā-/ *me/onā-)	Feminine middle (passive) participles from tense stems ending in the thematic vowel (*-e/o-)
*-(m̥)mo-	(*-(m̥)mo-)	Masculine/neuter participial suffix and superlative suffix; also nouns/ adjectives
*-(m̥)meA-	(*-(m̥)mā-)	Feminine participial suffix and superlative suffix; also nouns/adjectives
*- t^{h}(m̥)mo-	(*-t(m̥)mo-)	Masculine/neuter superlative suffix
*- t^{h}(m̥)meA-	(*-t(m̥)mā-)	Feminine superlative suffix
*-(r̥)ro-	(*-(r̥)ro-)	Masculine/neuter nouns/adjectives
*-(r̥)reA-	(*-(r̥)rā-)	Feminine nouns/adjectives
*-(t^{h})ero-	(*-(t)ero-)	Masculine/neuter comparative suffix
*-(t^{h})ereA-	(*-(t)erā-)	Feminine comparative suffix
-(l̥)lo-/-e-lo-	(*-(l̥)lo-/*-e-lo-)	Masculine/neuter nouns/adjectives
-(l̥)leA-/-e-leA-	(*-(l̥)lā-/*-e-lā-)	Feminine nouns/adjectives
-d^{h}-ro-/-d^{h}-lo-	(*-dh-ro-/*-dh-lo-)	Masculine/neuter nouns/adjectives
-d^{h}-reA-/-d^{h}-leA-	(*-dh-rā-/*-dh-lā-)	Feminine nouns/adjectives
*-b^{h}o-	(*-bho-)	Masculine/neuter nouns
*-b^{h}eA-	(*-bhā-)	Feminine nouns
-t^{h}o-/-e-t^{h}o-	(*-to-/*-e-to-)	Masculine/neuter participial adjectives and nouns connected with them
-t^{h}eA-/-e-t^{h}eA-	(*-tā-/-e-tā-)	Feminine participial adjectives and nouns connected with them
-t^{h}eA-(/-e-t^{h}eA-)	(*-tā-[/-e-tā-])	Abstract nouns
*-t^{h}o-	(*-to-)	Masculine/neuter suffix of comparison

*-t^{h}eA-	(*-tā-)	Feminine suffix of comparison
*-ist^{h}o-	(*-isto-)	Masculine/neuter superlative suffix
*-ist^{h}eA-	(*-istā-)	Feminine superlative suffix
-mn̥-t^{h}o-/-wn̥-t^{h}o-	(*-mn̥-to-/*-un̥-to-)	Masculine/neuter nouns
-mn̥-t^{h}eA-/-wn̥-t^{h}eA-	(*-mn̥-tā-/*-un̥-tā-)	Feminine nouns
*-k^{yh}o-	(*-k̂o-)	Masculine/neuter nouns/adjectives
*-k^{yh}eA-	(*-k̂ā-)	Feminine nouns/adjectives
*-(V)k^{h}o-	(*-(a^{x})qo-)	Masculine/neuter nouns/adjectives
*-(V)k^{h}eA-	(*-(a^{x})qā-)	Feminine nouns/adjectives
*-(i)sk^{h}o-	(*-(i)sk̂o-)	Masculine/neuter nouns; verb suffix forming present stems (iteratives, duratives, or distributives)
*-(i)sk^{h}eA-	(*-(i)sk̂ā-)	Feminine nouns; verb suffix forming present stems (iteratives, duratives, or distributives)
*-k'o-	(*-g̱o-)	Masculine/neuter nouns/adjectives
*-k'eA-	(*-g̱ā-)	Feminine nouns/adjectives
*-ey/-oy-/-i-	(*-ei̯-/-oi̯-/-i-)	Nouns/adjectives
-(n̥)ni-/-e/o-ni-	(*-(n̥)ni-/*-e/o-ni-)	Masciline/neuter nouns/adjectives
*-mi-	(*-mi-)	(?)
-(r̥)ri-/-(l̥)li-	(*-(r̥)ri-/*-(l̥)li-)	(?)
*-t^{h}i-	(*-ti-)	Agent nouns; abstract nouns
-t^{h}eAt^{h}(i)-/-t^{h}uAt^{h}(i)-	(*-tāt(i)-/*-tūt(i)-)	Feminine abstract nouns from nouns and adjectives
*-ew/-ow-/-u-	(*-eu̯-/-ou̯-/-u-)	Nouns/adjectives
*-yu-	(*-i̯u-)	(?)
*-(n̥)nu-	(*-(n̥)nu-)	Nouns/adjectives
-(r̥)ru-/-(l̥)lu-	(*-(r̥)ru-/*-(l̥)lu-)	Nouns/adjectives
*-t^{h}u-	(*-tu-)	Deverbative nouns
-iE-/-yeE-	(*-ī-/*-i̯ē-)	Feminine nouns
*-en-	(*-en-)	Nouns
*-yen-	(*-i̯en-)	Nouns
*-wen-	(*-u̯en-)	Nouns
*-men-	(*-men-)	Nouns
-r̥-/-r-/*-r̥H-	(*-r̥-/*-r-/*-r̄-)	Neuter nouns
*-(t^{h})er-	(*-(t)er-)	Agent nouns
*-t^{h}-	(*-t-)	Nouns/adjectives
*-nt^{h}-	(*-nt-)	Active participles
*-went^{h}-	(*-u̯ent-)	Denominative adjectives
*-t'-	(*-d̂-)	(?)
-k^{yh}-/-k^{h}-	(*-k̂-/*-q-)	(?)
*-k'- (and *k'^{y} ?)	(*-g̱- [and *-ĝ- ?])	(?)
*-es-	(*-es-)	Neuter nouns; adjectives; masculine/feminine nouns
*-s-	(*-s-)	Nouns

*-Ḫ̥-s-	(*-ə-s-)	Nouns
*-i̯-s-	(*-i-s-)	Nouns
-u-s- (-wes-)	(*-u-s- [*-u̯es-])	Nouns
*-(i)yes-	(*-(i)i̯es-)	Primary comparative suffix
*-wes-	(*-u̯es-)	Active perfect participle

Notes:

1. Taking into consideration Hittite and the other Anatolian languages, it is clear that a majority of the above derivational suffixes developed after the Anatolian languages became separated from the main speech community. Moreover, the Anatolian languages make use of several derivational suffixes not found in the Non-Anatolian daughter languages. For information on Hittite derivational morphology, cf. Hoffner—Melchert 2008:51—63; Sturtevant 1951:67—81.
2. Some of the above derivational suffixes have a rather limited distribution, and it may be questioned whether they should even be reconstructed for the Indo-European parent language.

18.7. YUKAGHIR

Nikolaeva (2006:79—83) lists a great variety of inflectional and derivational affixes found in both Tundra (Northern) and Kolyma (Southern) Yukaghir, together with their proposed Proto-Yukaghir reconstructions. They are listed in full below — the first column gives the attested affixes in Kolyma (Southern) Yukaghir, the second column gives the attested affixes in Tundra (Northern) Yukaghir, the third column gives the Proto-Yukaghir reconstructions, and the fourth column gives the meaning of the affix (in abbreviated form) (Nikolaeva's transcription has been retained):

Southern / Kolyma	Northern / Tundra	Proto-Yukaghir	Meaning
-a:/-e:		*-əW	ADV.LAT
-aj-/-ej-/-j-		*-(ə)j-	PERF
-a:q	-a:q	*-a:k	ADV.LOC
-bə-		*-wə-/*-mpə-	INCH
-bə-/-b-	-bə-/-b-	*-mpə-	N
-bo:-	-bo:l-	*-mpəwl-	QUAL
	-buń-	*-mpuń-	DES
-č-	-č-	*-č-	CAUS, TR
-č-		*-č-	ITER
-ča:/-če:	-ča:/-če:	*-čəW	N
	-či:-	*-či:-	CAUS
-či:-		*-či:-	DEL
	-ča:n	*-či:	DIM
	-čəń-	*-čəń-	STAT
-də		*-δə/*-ntə	INDEF
-də	-dəŋ	*-ntəŋ	ADV.DIR

-də-	-də-	*-ntə-	3POS
-də	-rə	*-δə	SS.ITER
-də-/-d-	-rə-/-r-	*-δə-	INTR, V
-də-	-də-	*-ntə-	CAUS, TR, V
-de:	-de:	*-nte:	DIM
-di:		*-δi:/*-nti:	TR
-d′ə	-d′ə	*-ńčə	FREQ
-d′ə-	-d′ə-	*-ńčə-	INTR
-d′ə-		*-ńčə-	TR
-d′ə-		*-ńčə-	N
-d′a:-/-d′e:-	-d′a:-/-d′e:-	*-ńčəW-	HAB
-di:-	-ri:-	*-δi:-	TR
-daj-/-dej-		*-δəj-/*-ntəj-	CAUS.PERF, TR.PERF
	-dək/-rək/-dəŋ/-rəŋ	*-δək	SS.IMPF
-dik		*-ntik	PRON.PRED
-din	-din	*-ntin	DAT.POS, SUP
	-dič-/-rič-	*-δič-	CAUS.MULT
-(də)llə		*(ntə)llə	SS.PERF
-dejlə		*-ntəγələ	POS.ACC
-dejnə		*-ntəγənə	DS
-e:-	-e:-	*-e:-	CAUS, TR
-gə-/-γə-	-gə-/-γə-	*-ŋkə-/*-γə-	ITER
-gə-	-γə-	*-ŋkə-/*-γə-	HORT
-gə/-γə	-gə/-γə	*-ŋkə/*-γə	ITRJ
-gə	-γə	*-ŋkə	LOC.DS
-gə/-γə	-gə/-γə	*-ŋkə/*-γə	N, INTJ
-gi	-gi	*-γi	3POS
-gi:-	-gi:-	*-ŋki-:/*-γi:-	TR
-gət	-γət	*-ŋkət	ABL
-gən	-γən	*-ŋkən	PROL
-gələ/-jlə		*-γələ	ACC
-gənə/-jnə		*-γənə	LOC, DS
	-γənə	*-γənə	LOC, DS, ACC
-gu(də)/-γu(də)	-gu(də)/-γu(də)	*-ŋku(ntə)/*-γu(ntə)	ADV.DIR
-gətə/*-γətə		*-ŋkətə/*-γətə	ADV
	-γənək	*-ŋkənək/*-γənək	IMP.FUT
-i:-	-i:-	*-i:-	CAUS, TR
-i:	-i:	*-i:	N
	-i:čə-	*-i:čə-	DIR
-j	-j	*-j	TR.1PL
-j	-j	*-j	INTR.3

-ja:-/-je:-		*-jəW-	INCH
-jə/-j	-jə/-j	*-jə	IMPF.PART
-ji:-	-ji:-	*-ji:-	ITER
-ji:-		*-ji:-	DIR
-jo:-		*-jəw-	QUAL
	-ji:l	*-ji:l	COLL
-jək	-jək	*-jək	INTR.2SG
-jə	-jəŋ	*-jəŋ	INTR.1SG
-(j)o:n-/-(j)o:d-		*-(j)o:nt-	SN
-j(ə)l′i	-j(ə)l′i	*-jəl′i	INTR.1PL
-j(ə)mət	-j(ə)mut	*-jəmət/*-jəmut	INTR.2PL
-k	-k	*-k	PRED
-k	-k	*-k	INTER.2SG
-k	-k	*-k	IMP
-l	-l	*-l	N, AN, OF, IPL, SF
-l	-l	*-l	PRON.ACC K
	-(l)a:/-(l)e:	*-(l)əW	INCH
-lə		*-lə	INSTR
-l′ə-	-l′ə-	*-l′ə-	INTR
-lə-	-lə-	*-lə-	PROH
-lə	-lə	*-lə	ACC
-l′ə	-l′ə	*-l′ə	POS
-l′ə-	-l′ə-	*-l′ə-	N
-le:		*-le:	DIM
-l(u)		*-l(u)	1/2
-lbə		*-lpə	INCH
	-ləŋ	*-ləŋ	PRED
-lək	-lək	*-lək	PRED, INSTR
-lək	-lək	*-lək	PROH
-l′əl	-l′əl	*-l′əl	EV
	-l′əlk	*-l′əlk	PRON.NOM
	-ləd̥ə	*-ləðə/*-ləntə	INSTR
-m	-m	*-m	TR.3SG
-m	-m	*-m	INTER.1SG
-m-		*-m-	BP
-m-	-m-	*-m-	INCH
-mə	-mə	*-mə	PERF.PART
-mə	-mə	*-mə	N
-mə	-mə	*-mə	TEMP
-mə	-məŋ	*-məŋ	OF.1/2SG
-me:-		*-me:-	QUAL
	-mo:l-	*-məwl-	DEL
	-mk	*-mk	TR.2PL
-mək	-mək	*-mək	TR.2SG

-mət		*-mət	TR.2PL
-mələ/-mlə	-mələ/-mlə	*-mələ/*-mlə	OF.3SG
-n	-n	*-n	HORT.3SG
-n	-ń	*-ń	DAT
-n	-ń	*-ń	ADV
-n/-d	-n/-d	*-nt	GEN, ATTR
	-ŋ	*-ŋ	EMPH
-ŋ	-ŋ	*-ŋ	PRON.ATTR
	-ŋ	*-ŋ	TR.1SG
-na:-	-na:-	*-na:-	INCH
-n(ə)	-n(ə)	*-n(ə)	ADV.LOC, ADV.LAT
-nə-	-nə-	*-nə-	INTR
-ńə	-ńəŋ	*-ńəŋ	COM
-ńə-/-ń-	-ńə-/-ń-	*-ńə-	PROPR
-n-	-n-	*-n-	IMPF
	-na:-	*-na:-	INCH
-ńo:		*-ńöw	COM
-ŋi-	-ŋi-	*-ŋi-	PL
-ŋu-	-ŋu-	*-ŋu-	PL
-ŋa:	-ŋa:	*-ŋam	TR.3PL
	-ŋo:-	*-ŋəw-	RES
-ŋin	-ŋiń	*-ŋiń	DAT
-ńit, -ńut		*-ńit/*-ńut	SS.CONN
-ŋo:n		*-ŋəwn	TRANS
-ŋo:t		*-ŋəwt	TRANS
-ŋidə		*-ŋiðə/*ŋintə	COND.CONV
-ŋidə	-ŋidə	*-ŋintə	ADV.LAT
-ŋilə	-ŋilə	*-ŋilə	OF.3PL
	-ŋo:ri:-/-mo:ri:-	*-ŋəwri:-	TR
-nun(n)-	-nun(n)-	*-nun(n)-	HAB
-o:-	-o:-	*-əw-	RES, V
-o:l′-		*-o:l′-	DES
	-o:l-	*-əwl-	RES
	-o:l-	*-əwl-	TRANS
-o:k	-o:k	*-o:k	INTER.1PL
	-pə-	*-pə-	V
-pə-/-p-	-pə-/-p-	*-pə-	PL
-qa:-/-ke:-	-qa:-/-ke:-	*-kəW-	INCH
-qə/-kə		*-kə	ADJ
-rə- /-r-	-rə-/-r-	*-rə-	CAUS, TR, APPL
	-rə-/-r-	*-rə-	NONIT
-ri:-	-ri:-	*-ri:-	APPL
-raj-/-rej-	-raj-/-rej-	*-rəj-	PERF

-rkə-/-rqə-	-rkə-/-rqə-	*-rkə-	N
	-rəldə	*-rəltə	SS.PERF
	-rələk	*-rələk/*-ðələk	SS.PERF
-š-		*-s-	ORD
-šə-/-š-	-sə-/-s-	*-sə-	CAUS, TR
-ši:-		*-si:-	CAUS
-šaj-/-šej-		*-səj-	PERF
	-sči:-	*-sči:-	CAUS
	-səsči:-	*-səsči:-	CAUS
-ščilʹe-		*-sčilʹə-	CAUS
-t	-t	*-t	ADV.ABL
-t	-r	*-ð	SS.IMPF
-t	-r	*-ð	N
-tə-/-t-	-tə-/-t-	*-tə-	FUT
-tə-/-t-	-tə-/-t-	*-tə-	CAUS, TR
	-ttə-	*-ttə-	CAUS, TR
	-tnə	*-tnə	ADV
-taj-/-tej-	-taj-/-tej-	*-təj-	PERF
	-ti:lʹə	*-ti:lʹə	CAUS
	-ttərəj/-ttrəj-	*-ttərəj	INT.CAUS
-təgə-/-tkə-	-təgə-/-tkə-	*-təɣə-/*-təŋkə-	AUGM
	-təgi-/-tki-	*-təɣi-/*-təŋki-	AUGM
-u:	-u:	*-u:	N
-u:-	-u:-	*-u:-	INTR
	-wə	*-wə	INTR
	-wrə	*-wrə	N
-žə-/-žu-		*-nčə-	ITER
-žə-		*-nčə-	TR
-ži:-		*-nči:-	CAUS, TR

Note: Cf. Nikolaeva 2006:xii—xiii for an explanation of the abbreviations.

18.8. URALIC

The Proto-Uralic root structure patterning was fairly straightforward (cf. Bakró-Nagy 1992, especially pp. 133—158):

1. There were no initial consonant clusters in Proto-Uralic (cf. Décsy 1990:26). Medial clusters were permitted, however (cf. Décsy 1990:27).
2. Three syllable types were permitted: **V*, **CV*, **CVC* (cf. Décsy 1990:34—35). Initially, **V* comes from earlier **HV*, upon loss of the preceding laryngeal.
3. All Proto-Uralic words ended in a vowel (cf. Décsy 1990:26 and 54).
4. Derivational suffixes had the form **-CV* (cf. Décsy 1990:58). Note: Proto-Uralic did not have prefixes or inflixes (cf. Décsy 1990:58).

Proto-Uralic did not differentiate between nominal and verbal stems (cf. Décsy 1990:56). Only pronouns existed as an independent stem type. Moreover, adjectives probably did not exist as a separate grammatical category (cf. Abondolo 1998a:18).

Bakró-Nagy (1992:8 and 14) reconstructs the general structure of Proto-Uralic root morphemes as follows:

$$\#C(V)\ \left\{ \left\{ \begin{matrix} CCC \\ CC \\ C \end{matrix} \right\}\ V \right\}\ (+CV)\#$$

Bakró-Nagy (1992:14—15) divides the above root structure into the following two patterns (see also Collinder 1965:44—45):

Vowel-initial Patterns	Consonant-initial Patterns
V	CV
VCV	CVCV
VCCV	CVCCV
VCCCV	CVCCCV
VCVCV	CVCV-CV
VCCVCV	CVCCV-CV
VCV-CV	CVCCV-CCV
VCCV-CV	CVCCV-CV-CCV
VCV-CCV	

Furthermore, she notes (1992:15):

1. Monosyllabic patterns (V and CV) reflect non-lexical morphemes like particles or pronouns.
2. In patterns below the horizontal line, the sequences following the hyphen (-CV, -CCV) represent derivational suffixes. Note: According to Collinder (1965:39), Proto-Uralic had the following kinds of suffixes (in the broadest sense): (1) derivational suffixes; (2) inflectional endings; and (3) enclitics (see also Décsy 1990:58). The suffixes had two variants, one with a front vowel (C$\ddot{V}$ [Rédei writes C$\breve{\text{y}}$]) and one with a back vowel (C$\mathring{V}$ [Rédei writes C$\breve{\text{ɤ}}$]), which alternated in accordance with the rules of vowel harmony.
3. Several of the above patterns (#VCVCV#, #VCCVCV#, #VCCCV#, and #CVCCCV#) are extremely rare.

Collinder (1965:44) states that the most frequent stem types in Common Uralic and Common Finno-Ugrian were:

$$VCV,\ CVCV,\ VC_1C_2V,\ CVC_1C_2V$$

Stems with medial geminated consonants (*-pp-*, *-tt-*, *-kk-*) also occurred:

$$VC_1C_1V,\ CVC_1C_1V.$$

Aikio (to appear, pp. 36—37) lists the following derivational suffixes, together with their functions, that are probably to be reconstructed for Proto-Uralic (see also Raun 1988b:565—568; Collinder 1960:220—228, 255—281 and 1963:104—122; Décsy 1990:60—65) (Aikio's transcription has been retained). Aikio also gives examples — these are not included here:

	Suffix	Function
Deverbative Nouns	**-mA*	general nominalizer
	(?) **-o* / (?) **-w*	general nominalizer
	**-pA*	active participle
	**-ntA*	action noun
	**-jA*	agent noun
	**-śA*	participle with unclear semantics
	**-kkAs(i)*	inclinative adjective or agent noun
	**-mAktAmA*	negative participle
Denominative Nouns	**-kA*	unclear semantics, forms both nouns and adjectives
	**-kkA*	unclear semantics, forms both nouns and adjectives
	**-kśi*	relational animate noun
	**-ńśA*	collective animate noun
	**-ksi*	unclear semantics
	**-wiksi*	unclear semantics
	**-ŋA*	proprietive adjective
	**-ji*	proprietive adjective
	**-ktAmA*	caritive adjective
	**-mpA*	moderative or comparative adjective
	**-mtV*	ordinal number
Denominative Verbs	**-tA-*	general verbalizer
	**-ji-*	general verbalizer
	**-li-*	general verbalizer
	**-mi-*	transformative
	**-mtA-*	factitive
	**-mtAw-*	transformative / stative (?)
	(?) **-o-*	unclear semantics

Deverbative Verbs	*-*tA*-	causative
	*-*ptA*-	causative
	*-*ktA*-	causative
	*-*w*-	stative / automative passive
	*-*li*-	momentative / inchoative (?)
	*-*lta*	momentative (?)
	*-*nti*-	frequentive / imperative (?)
	*-*kśi*-	frequentive (?)
	*-*ji*-	unclear semantics

Aikio (to appear, pp. 40—41) mentions that compounding must have also been a highly productive means of word formation in Proto-Uralic, though he notes that relatively few such compounds can be reconstructed. He further mentions that all known examples involve nouns. Finally, he lists and discusses a rather small set of copulative compounds with the meanings ‘mother-in-law’ and ‘father-in-law’.

18.9. ALTAIC

Like Uralic-Yukaghir and Elamo-Dravidian, the Altaic languages are agglutinating in structure. Pronominal stems and particles were monosyllabic (**(C)V*), while nominal and verbal stems were typically disyllabic (**(C)VCV* or **(C)VCCV*). Polysyllabic stems could be derived from the disyllabic stems by the addition of suffixes. The addition of suffixes caused no changes in the vowel of the stem, but the vowels of the suffixes were subject to vowel harmony, which means that their vowels were adjusted to the vowel of the stem. The undifferentiated stems were real forms in themselves and could be used without additional suffixes. The suffixes, both derivational and inflectional, were added mechanically to the stem.

According to Starostin—Dybo—Mudrak (2003:22—24), the most common root structure pattern in Proto-Altaic was **CVCV*, occasionally with a medial consonant cluster — **CVCCV*. The final vowel, however, was very unstable: it is best preserved in (Manchu-)Tungus languages (though it is not always easily reconstructable due to morphological processes), and it is frequently dropped in Korean, Mongolian, and Turkic (in the latter family, in fact, in the majority of cases). Japanese usually preserves the final vowel, although its quality is normally lost; however, in cases where the final (medial) root consonant is lost, Japanese reflects original disyllables as monosyllables.

Japanese also has quite a number of monosyllabic verbal roots of the type **CVC*-. These roots were originally disyllabic as well. However, reconstructing them as **CVCa*- is certainly incorrect. The Old Japanese verbal conjugation shows explicitly that the verbal stems can be subdivided into three main types: **CVCa*- (those having the gerund in *-e* < **-a-i*), **CVCə*- (those having the gerund in *-i* < **-ə-i*), and **CVC*- (those having the gerund in *-ji* < **-i*). Here, there is a possibility that the latter type reflects original verbal roots **CVCi* (occasionally perhaps also **CVCu*, though there are reasons to suppose that some of the latter actually merged

with the type **CVCə-*). The gerund form in **-i* may actually reflect the original final root vowel that had earlier disappeared before other verbal suffixes of the type **-V(CV)-*.

A small number of trisyllabic roots such as **alak^{h}u* 'to walk', **kabari* 'oar', **k^{h}obani* 'armpit', etc. can also be reconstructed for Proto-Altaic. It cannot be excluded that, in many or most of these cases, the final syllable was originally a suffix, but the deriving stem was not used separately, and the derivation had already become obscure in the proto-language.

The monosyllabic structure **(C)V* was typical for pronominal and auxiliary morphemes, but a small number of verbal (and, quite exceptionally, nominal) monosyllabic roots can also be reconstructed.

A special case involves a number of verbal roots that appear as monosyllables of the type **CV* in some languages but have the structure **CVl(V)* or, less frequently, **CVr(V)* in others. Starostin—Dybo—Mudrak reconstruct disyllables here, but note that the exceptional loss of **r* and **l* remains unexplained. A possible solution would be to reconstruct those roots as **CVC*, with occasional loss of the root-final resonant. However, the number of examples is not large, and the roots in question are frequently used as auxiliary verbs, which by itself could explain the exceptional phonetic development. It is also possible that **-r-* and **-l-* were originally suffixed and that the roots belonged instead to the rare type **CV*. Starostin—Dybo—Mudrak note that the problem requires further investigation.

There were four fundamental stem types in Proto-Altaic:

1. Verbal stems
2. Nominal and adjectival stems
3. Pronouns
4. Particles

There was a strict distinction between nominal and verbal stems.

Starostin—Dybo—Mudrak (2003:173—220 [summary on page 220]) identify the following Proto-Altaic derivational suffixes (the transcription has been changed to conform with what is used in this book):

*-b-	a) deverbative verbal passive/causative
	b) denominative nominal (collective?)
*-p^{h}-	deverbative passive/instrumental
*-m-	a) deverbative nominal
	b) denominative nominal (adjectival)
*-d-	denominative/deverbative adjectival
*-t-	a) deverbative verbal intransitive/passive
	b) denominative/deverbative adjectival
*-t^{h}-	deverbative verbal transitive/motional
*-kt^{h}-	denominative/deverbative adjectival
*-n-	a) deverbative verbal intransitive (reflexive)
	b) denominative nominal

*-l- a) deverbative nominal
b) denominative nominal (attributive)
*-r- a) deverbative nominal (intransitive)
b) denominative nominal (attributive)
*-čʰ- a) denominative diminutive
b) deverbative verbal intensive
*-ǯ- a) adjectival
b) intransitive (medial?)
*-lʸ- verbal reciprocal
*-rʸ- a) deverbative transitive
b) suffix of paired body parts
*-y- denominative expressive
*-s- a) denominative nominal (= pronominal)
b) deverbative/denominative desiderative/inchoative
*-g- a) denominative/deverbative nominal
b) factitive/intensive deverbative verbal
*-k- denominative nominal; suffix of small animals
*-kʰ- a) attributive (→ denominative nominal)
b) diminutive
c) deverbative verbal
*-ŋ- deverbative/denominative nominal

In her study of Transeurasian (TEA) verb morphology, Robbeets (2015) identifies the following shared forms (she includes Japonic and Korean):

Proto-TEA	Proto-Japonic	Proto-Korean	Proto-Tungusic	Proto-Mongolic	Proto-Turkic
**ana-* negation	**ana-* negation	**an-* negation	**ana-* negation		[**an-*] negation
**ə-* negation			**e-* negation	**e-se-* negation	**e-* negation
**-lA-* manipulative	**-ra-* manipulative		**-lĀ-* manipulative	**-lA-* manipulative	**-lA-* manipulative
**-nA-* processive	**-na-* processive	**-nO-* processive	**-nA-* processive	**-nA-* processive	**-(X)n-* processive
**(-)ki-* 'do, make' iconic	**-ka-* iconic	**-ki-* iconic	**-ki-* iconic	**(-)ki-* 'do, make' iconic	**ki(-)l-/ *-kI-* 'do, make' iconic
**-mA-* inclination	**-ma-* inclination	**-mO-* inclination	**-mA-* inclination	**-mA-* inclination	
**-gA-* inchoative	**-ka-* inchoative	**-k(O)-* inchoative	**-gA-* inchoative	**-gA-* inchoative	**-(X)k- ~ *-(X)g-* inchoative

Proto-TEA	Proto-Japonic	Proto-Korean	Proto-Tungusic	Proto-Mongolic	Proto-Turkic
*-*ti*- causative	*-*ta*- causative passive	*-*ti*- causative passive	*-*ti*- causative passive	*-*ti*- causative	*-*tI*- causative passive
*-*pU*- reflexive anticaus.	*-*pa*- reflexive anticaus.	*-*pO*- anti-causative	*-*p*- reflexive anticaus.	*-*βU*- reflexive anticaus.	*-*U*- reflexive anticaus.
*-*dA*- fientive	*-*ya*- fientive passive		*-*dĀ*- fientive	*-*dA*- fientive passive	*-*(A)d*- fientive anticaus.
*-*rA*- anticaus.	*-*ra*- anticaus.	*-*(u)l*- anticaus.	*-*rA*- anticaus.	*-*rA*- anticaus.	*-*rA*- anticaus.
*-*gi*- creative causative	*-*(k)i*- creative causative anticaus.	*-*ki*- creative causative passive	*-*gī*- creative causative		
*-*rA* lexical NML	*-*ra* lexical NML	*-*l* lexical NML	*-*rA* lexical NML	*-*r* lexical NML	*-*rV* lexical NML
	*wo-*ra* clausal NML	*-*wo-l* clausal NML	*-*rA* clausal NML	*-*r* clausal NML	
	*-*wo-ra* relativizer	*-*wo-l* relativizer	*-*rA* relativizer		*-*rV* relativizer
	*-*wo-ra* finite	*-*wo-l* finite	*-*rA* finite	*-*r* finite	*-*rV* finite
*-*mA* lexical NML	*-*m* lexical NML	*-*m* lexical NML	*-*mA* lexical NML	*-*mA*~*-*m lexical NML	*-*mA*~*-*m lexical NML
	*-*wo-m* clausal NML	*-*wo-m* clausal NML	*-*mA* clausal NML	*-*mA*~*-*m clausal NML	
	*-*wo-m* finite	*-*wo-m* finite	*-*mA* finite	*-*mA*~*-*m finite	
*-*n* lexical NML	*-*n* lex. NML	*-*n* lexi. NML	*-*nA* ~ *-*n* lex. NML	*-*n* lex. NML	*-*n* lex. NML
	*wo-*n* clausal NML	*-*wo-n* clausal NML	*-*nA* ~ *-*n* clausal NML	*-*n* clausal NML	*-*n* clausal NML
	*-*wo-n* relativizer	*-*wo-n* relativizer			*-*n* relativizer
	*-*wo-n* finite	*-*wo-n* finite	*-*nA* ~ *-*n* finite	*-*n* finite	*-*n* finite

Proto-TEA	Proto-Japonic	Proto-Korean	Proto-Tungusic	Proto-Mongolic	Proto-Turkic
*-*xA*~*-*kA* resulative lexical NML	*-*ka* resulative lexical NML	*-*ka(-)i* resulative lexical NML	*-*xĀ*~*-*kĀ* resulative lexical NML	*-*xA*~*-*kA* resulative lexical NML	*-*xA*~*-*kA* resulative lexical NML
			*-*xĀ*~*-*kĀ* clausal NML	*-*xA*~*-*kA* clausal NML	
	*-*ka* relativizer		*-*xĀ*~*-*kĀ* relativizer	*-*xA*~*-*kA* relativizer	*-*xA*~*-*kA* PFV.FUT relativizer
	*-*ka* finite		*-*xĀ*~*-*kĀ* past finite	*-*xA*~*-*kA* past finite	*-*xA*~*-*kA* future finite
*-*sA* resultative lexical NML	*-*sa* resultative lexical NML		*-*sA* ~ *-*sī* < **sA*-*ī* resultative lexical NML	*-*sA* ~ *-*sī* < **sA*-*ī* resultative lexical NML	
			*-*sA* ~ *-*sī* clausal NML	*-*sA* ~ *-*sī* clausal NML	*-*sA* perfective clausal NML
			*-*sA* ~ *-*sī* relativizer		
	*-*sa* finite		*-*sA* ~ *-*sī* finite	*-*sA* ~ *-*sī* finite	*-*sA* past finite
*-*i* ~ *-Ø* nominal-izer	*-*i* ~ *-Ø* nominal-izer infinitive converb	*-*i* ~ *-Ø* nominal-izer converb adverb	*-*ī* ~ *-Ø* nominal-izer	*-*i* ~ *-Ø* nominal-izer converb adverb	*-*I* ~ *-Ø* nominal-izer infinitive converb adverb
*-*xU*~**kU* nominal-izer infinitive	*-*ku* nominal-izer converb adverb	*-*k(ʌ)* ~ *-*kū* nominal-izer infinitive converb adverb	*-*xū* ~ *-*kū* nominal-izer converb adverb	*-*xU*~*-*kU* nominal-izer infinitive converb	*-*xU*~*-*kU* nominal-izer infinitive
*-*Ø* imperative	*-*Ø* imperative	*-*Ø* imperative	*-*Ø* imperative	*-*Ø* imperative	*-*Ø* imperative

Note: Abbreviations: NML = nominalizer; PFV = perfective; FUT = future.

Let us now look at the individual branches. According to Johanson (1998a:35):

> The structure of the Turkic word is agglutinative, that is characterised by a highly synthetic structure with numerous bound morphemes, and a juxtaposing technique with clear-cut morpheme boundaries and predictable allomorphic variation.

As Johanson (1998a:36) further points out, long sequences of morphs are possible. Moreover, there is a considerable morphological regularity in the Turkic languages:

> The morphemes have few and phonologically predictable allomorphs, added rather mechanically to the stem according to the rules of assimilation mentioned above. The agglutinative technique yields transparency: regular, easily segmentable structures.

As a general rule (Johanson 1998a:36):

> … Turkic languages basically lack declensional and conjugational classes, irregular verbs, suppletive forms, etc.

Finally (Johanson 1998a:37):

> The order of suffixes is subject to rigid rules. Suffixes form distributional classes according to their ability to occupy relative positions within the word, that is their relative distance to the primary stem. Suffixes modifying the primary stem directly are closest to it, which means that derivational suffixes precede inflectional ones. Each added suffix tends to modify the whole preceding stem, e.g. Kirghiz *üylörömdö* (‘house + plural + my + in’) ‘in my houses’.

In the Turkic languages, verb stems are sharply distinguished from noun stems. As noted above, derivational suffixes can be added directly to such stems, yielding the following four derivational types:

1. Denominative verb stems;
2. Deverbative verb stems;
3. Denominative noun stems;
4. Deverbative noun stems.

However, as noted by Erdal (2004:138—139, §3.01), in Old Turkic, the rule that derivational suffixes precede inflectional suffixes applies mainly to verb stems. In noun stems, on the other hand, derivational suffixes can follow inflectional suffixes. Nonetheless, the distinction between the above four types of suffixes is clear.

Proto-Mongolic word structure was also agglutinative, with derivational and inflectional suffixes added fairly mechanically to a noun or verb stem (cf. Janhunen 2003a:10). Noun stems were not as sharply distinguished from verb stems in Proto-

Mongolic as in Turkic, and both stem types could have an identical shape — Janhunen (2003a:10) cites **emkü-* 'to put into the mouth' as against **emkü* 'bite' as examples. As in Turkic, the following four derivational types existed:

1. Denominative verb stems;
2. Deverbative verb stems;
3. Denominative noun stems;
4. Deverbative noun stems.

For (Manchu-)Tungus, we will focus here exclusively on Manchu derivational morphology. In should be noted that, in her 2002 *Manchu Grammar*, Liliya M. Gorelova brings in a lot of information from other Altaic languages to illustrate and contrast points of Manchu grammar.

According to Gorelova (2002:123), Manchu is the most analytical Altaic language, with a relatively underdeveloped inflectional morphology. Different parts of speech are not sharply distintinguished. Nonetheless, verb classes can be clearly identified by their suffixes, which are both uniform and specific. Gorelova (2002: 123) lists the following verb suffixes: *-mbi*, *-mbumbi*, *-ka/-ko/-ke*, *-ha/-ho/-he*, *-ra/ -ro/-re*, *-habi/-hobi/-hebi*, *-mbihe*, *-kini*, *-me*, *-fi* (*-pi*), *-ci*, and *-cibe*. Noun suffixes, on the other hand, are not as numerous and uniform as verb suffixes. Most nouns are derivative (cf. Gorelova 2002:194). The rules of vowel harmony apply to the majority of these suffixes, both nominal and verbal. (Similar rules are found in Turkic [cf. Johanson 1998a:32—34] and Mongolic [cf. Janhunen 2003a:8—12].)

As noted by Sinor (1968:260), each Manchu word is, or can be, composed of the following elements: root + one or several derivational suffixes + one or several inflectional endings (see also Gorelova 2002:239). Unextended roots can be used as full words in and of themselves. In general, adding suffixes does not cause any changes to the root. The same four derivational types existed in (Manchu-)Tungus as in Turkic and Proto-Mongolic (see above).

For more information on Old Turkic noun derivation, cf. Erdal 2004:145—156, and for verb derivation, cf. Erdal 2004:227—228; see also Erdal 1991. For details on Manchu noun derivation, cf. Gorelova 2002:194—200, and for verb derivation, cf. Gorelova 2002:233—239. For specifics on Written Mongolian noun derivation, cf. Hambis 1945:5—13, and for verb derivation, cf. Hambis 1945:41—47; see also Kempf 2013.

18.10. CHUKCHI-KAMCHATKAN

The Chukchi-Kamchatkan languages are agglutinating (cf. Fortescue 2005:439). In Chukchi, however, some fusion has occurred, particularly in the verb. Chukchi nouns distinguish singular from plural. Fortescue (2005:426—427) lists seven cases for Proto-Chukchi-Kamchatkan: absolutive, dative, locative, comitative 1 ('together with'), comitative 2 ('in the presence of'), instrumental, and referential ('oriented

towards, about, concerning, because of'); with the following additional four cases for Proto-Chukotian: ablative, vialis ('past or via'), allative, and attributive. Typical of the Chukotian branch is case marking of subjects and direct objects on the basis of an ergative-absolutive system (cf. Fortescue 2005:426), while Kamchadal / Itelmen has nominative-accusative alignment. There are two inflectional classes: class 1 covers inanimates and also human common nouns, while class 2 covers individualized persons, including certain kinship terms. Chukchi and Koryak also exhibit a certain degree of incorporation, though it is not as extensively used as in Eskimo-Aleut. Verbs clearly distinguish between transitive and intransitive, with the ergative being used in conjunction with transitive verbs (verb morphology is summarized in Fortescue 2005:428—432). Chukchi employs postpositions exclusively. Chukchi word order is rather free, with OV being slightly more predominant than VO.

Proto-Chukchi-Kamchatkan syllable structure was relatively simple *(C)V(C), with strict restrictions on consonant clusters (cf. Fortescue 2005:439).

Fortescue (2005:402—425) lists and discusses a great variety of Chukchi-Kamchatkan derivational affixes. The following is a summary of these affixes (PCK = Proto-Chukchi-Kamchatkan; PC = Proto-Chukotian; PI = Proto-Itelmen):

1. PCK *æ- -kæ = predicative (negative) formant (?)
2. PCK? *æm- 'only'
3. PC *æmqən- 'every'
4. PCK *-æt- = verbalizer [from *-ŋæt- (?); less intensive/active than *-æv-]
5. PCK? *-æv- = verbalizer
6. PC *-cæ(ŋ)- 'times'
7. PC *-cir- 'repeatedly (over a time)'
8. PCK? *-cit- 'one after another'
9. PC *-cŋat- = intensifier
10. PC *-c(ə)ŋə(n) 'big or bad'
11. PC *-cʀæt- 'repeatedly'
12. PC *-cʀə(n) '(one that is) most'
13. PC *-cʀenaŋ 'something like'
14. PC *-curm(ən) 'edge of'
15. PC *cəɣi- 'almost'
16. PC *-cəku(n) 'inside'
17. PC *ðæ- -ŋ(ə)- 'want to'
18. PCK *ðən- = transitivizer
19. PC *ɣæmɣæ- 'every or any'
20. PCK? *-ɣiniv 'collection or group'
21. PC *-ɣiŋ 'underneath'
22. PCK? *-ɣərŋə(n) 'quality or action of'
23. PC *-icŋə(n) 'instrument for -ing'
24. PCK *inæ- = antipassive [or detransitivizer]
25. PCK *-inæ = possessive ('pertaining to')
26. PCK *-inæŋ(æ) 'instrument for -ing'

27. PC *-janv(ə) ‘place with much’
28. PCK? *-jɣut ‘in order to’
29. PC *-jikwi- ‘along’
30. PC *-jŋə(n) ‘big’
31. PCK? *-jo = passive participle
32. PC *-jolɣə(n) ‘container for’
33. PC *-jut(æ) ‘each (a certain quantity)’
34. PC *-jərʀ(ən) ‘set or group of’
35. PC *-jəv- = intensifier
36. PCK *kæ- -linæ ‘(one) having’
37. PCK? *-kinæ ‘something associated with’
38. PC *-kv(ən) ‘something covering’
39. PCK? *-la- ‘several (do)’
40. PC *-læŋu ‘at a time’
41. PC *-(no)lŋ(ən) ‘edge or slope of’
42. PC *-lq(ən) ‘(on) top of’
43. PC *-lqiv- = semifactive (?)
44. PC *-lqəl ‘something intended for’
45. PCK? *-lʀæt- = continuous or repeated action
46. PCK *-lʀə(n) ‘one who -s’
47. PC *-lwən ‘collection of’
48. PCK *ləɣi- ‘real(ly)’
49. PC *-ləku(n) ‘between or among’
50. PI *mæc- ‘somewhat (more)’
51. PC *-macə(ŋ) ‘while -ing’
52. PC *-mil ‘like’
53. PC *-mk(ən) ‘group of’
54. PCK *næ- = passive
55. PC *-næqu ‘big’
56. PC *nuŋ- = negative formant
57. PCK *-nv(ə) ‘place of -ing’
58. PCK? *nə- -qinæ = adjective formant
59. PC *nə- -ʀæw = adverb formant
60. PCK? *-(ə)ŋ = (comparative) adverb formant
61. PC *-ŋit ‘(whole) period of’
62. PC *-ŋtæt- = intensifier
63. PC *-ŋvo- ‘begin to’
64. PC *-ŋərtə- ‘catch’
65. PC *-pil ‘little’
66. PCK? *pəl- ‘completely’
67. PC *-pət ‘piece of’
68. PCK *-q = adverb formant
69. PC *qæj- ‘young (of animal)’
70. PC *-qæv(kinæ) = ordinal formant
71. PC *-ræt ‘set of’

72. PCK *-rɣæri ‘a group of (so many)’
73. PC *-ril ‘set or frame of’ [inanimate only]
74. PCK *-ruʁ- = inchoative or collective [that is, intensive (?)]
75. PCK? *tæ- -ŋ(ə) ‘make’
76. PC *-tæɣən ‘near or at the edge of’
77. PCK *-tku- = frequent or protracted action
78. PCK? *-tkən ‘on (tip or top of)’
79. PC *-turæ(v)- ‘un-’
80. PC *-tva- = resultative state
81. PCK *-tvi- ‘become’
82. PC *-təvæ- ‘remove’
83. PC *-u- ‘acquire or consume’
84. PCK? *-vəlŋə- = reciprocal action
85. PC *-vərrə(n) ‘likeness of’

Nearly all of the above derivational affixes arose within Chukchi-Kamchatkan proper and do not go back to Proto-Nostratic.

18.11. GILYAK / NIVKH

According to Gruzdeva (1998:16):

> Nivkh is an agglutinating synthetic language which admits, however, polysemy of morphemes. *ESD* [East Sakhalin Dialect] displays also some analytical features. One of [the] moot points of Nivkh morphology is a problem of incorporation. The question is about such constructions as *attribute* + *head word* … and *direct object* + *verb* …, which are sometimes considered as incorporated complexes. This point of view is based on the fact that within these two constructions the words form particularly close units not only syntactically, but also phonologically in terms of alternation of the initial segments of second words…
>
> It is generally said that Nivkh distinguishes eight word classes, i.e., nouns, numerals, pronouns, verbs, adverbs, graphic words, connective words (including postpositions, sentence connectives, and particles), and interjections. The class ‘adjective’ does not exist, the semantic function of adjectives being performed by qualitative verbs, which are characterized by all verbal categories…

Gilyak / Nivkh nouns make use of both prefixes and suffixes, following two basic patterns: (1) root + suffix(es) and (2) prefix + root + suffix(es). There are currently two numbers: singular and plural. However, a dual also once existed, and it has left traces in the modern dialects. The general scheme is as follows: stem + number + case. Amur has eight cases (nominative, dative-accusative, comparative, locative, locative-ablative, dative-additive, limitative, and instrumental), while East Sakhalin has seven, lacking the locative (cf. Gruzdeva 1998:18). There is also a vocative.

Gruzdeva (1998:22) notes that there are three means of noun derivation in Gilyak / Nivkh: (1) suffixation, (2) substantivization, and (3) compounding of stems. She lists the following derivational suffixes:

1. Amur *-s*, East Sakhalin *-r* indicating an instrument of action;
2. *-f* indicating place of action;
3. *-k* indicating an object/person;

Nouns can also be derived from finite verb forms by means of the suffixes (Amur) *-d'/-t'*, (East Sakhalin) *-d/-nd/-nt*. Compound nouns are formed in accordance with the following patterns: (1) attribute + head noun and (2) direct object + attribute (participle) + head noun. Cf. Gruzdeva 1998:22—23.

As with nouns, Gilyak / Nivkh verbs make use of both prefixes and suffixes, following two basic patterns: (1) root + suffix(es) and (2) prefix + root + suffix(es). Typically, the suffixes follow the root in the following order: root + transitive / negative / tense-aspect / causative / modal / evidential / mood / number. More than one aspect or modal marker may appear on the verb.

Verb derivation makes use of both suffixes and compounding of stems.

18.12. SUMMARY / PROTO-NOSTRATIC

Proto-Nostratic root structure patterning (cf. Chapter 12, §12.3):

1. There were no initial vowels in Proto-Nostratic. Therefore, every root began with a consonant. (Loss of initial laryngeals in the early prehistory of the individual branches resulted in roots beginning with a vowel: **HVC-* > **VC-*.)
2. There were no initial consonant clusters either. Consequently, every root began with one and only one consonant. Medial clusters were permitted, however. (Changes specific to the individual branches later led to the development of initial consonant clusters in them.)
3. Two basic root types existed: (A) **C*$_1$*V* and (B) **C*$_1$*VC*$_2$, where *C* = any non-syllabic, and *V* = any vowel. Permissible root forms coincided exactly with these two syllable types.
4. A stem could either be identical with a root or it could consist of a root plus a single derivational morpheme added as a suffix to the root: **C*$_1$*VC*$_2$+*C*$_{DS}$- (DS = derivational suffix) Any consonant could serve as a suffix. Note: In nominal stems, this derivational suffix was added directly to the root: **C*$_1$*VC*$_2$+*C*$_{DS}$-. In verbal stems, it was added after the formative vowel: **C*$_1$*VC*$_2$+*V*$_{FV}$+*C*$_{DS}$-. (FV = formative vowel.)
5. A stem could thus assume any one of the following shapes: (A) **C*$_1$*V*-, (B) **C*$_1$*VC*$_2$-, (C) **C*$_1$*VC*$_2$+*C*$_3$-, or (D) (reduplicated) **C*$_1$*VC*$_2$-*C*$_1$*VC*$_2$-. As in Proto-Altaic, the undifferentiated stems were real forms in themselves and could be used without additional suffixes or grammatical endings. However, when so used, a vowel had to be added to the stem: (A) **C*$_1$*V-* > **C*$_1$*V* (no change), (B)

> *C_1VC_2- > *C_1VC_2+V, (C) *C_1VC_2+C_3- > *C_1VC_2+C_3+V, or (D) (reduplicated) * C_1VC_2-C_1VC_2- > * C_1VC_2-C_1VC_2+V. Following Afrasian terminology, this vowel may be called a "terminal vowel" (TV). Not only did terminal vowels exist in Proto-Afrasian (cf. Ehret 1995:15; Bender 2000:214—215 and 2007:737—739), they are also found in Dravidian, where they are called "enunciative vowels" (cf. Steever 1998a:15; W. Bright 1975; Krishnamurti 2003:90—91; Zvelebil 1990:8—9), and in Elamite (cf. Khačikjan 1998:11; Grillot-Susini 1987:12), where they are called "thematic vowels". In Proto-Dravidian, the enunciative vowel was only required in stems ending in obstruents, which could not occur in final position.

The derivational suffixes were derivational rather than grammatical in that they either changed the grammatical category of a word or affected its meaning rather than its relation to other words in a sentence. Cf. Crystal 2008:138 and 243. Any consonant could serve as a derivational suffix.

While there were noun-deriving and verb-forming suffixes, the presence of a suffix was not necessary to the use of a noun or verb in grammatical constructions. Unextended roots could be used as either nouns or verbs.

Active verbs could be used as nouns denoting either (1) the action of the verb or (2) the agent or instrument of the action, while stative verbs could be used as nouns to indicate state. Noun stems could also be used as verbs. Thus, the distinction between nouns and verbs was not always clear. There was also a solid core of primary (underived) nouns. Reduplication was a widespread phenomenon. Undoubtedly, compounds also existed.

As can be seen from the earlier sections of this chapter, the original root structure patterning was maintained longer in Afrasian, Dravidian, and Altaic than in the other branches, while the patterning found in Proto-Indo-European and Proto-Kartvelian has been modified by developments specific to each of these branches. The root structure constraints found in Proto-Indo-European were an innovation as were the homorganic consonant clusters found in Kartvelian. In Proto-Uralic, the rule requiring that all words end in a vowel was an innovation and arose from the incorporation of the so-called "terminal vowel" into the stem.

On the basis of the evidence of Proto-Indo-European, Proto-Kartvelian, Proto-Afrasian, Proto-Dravidian, and Proto-Altaic, it may be assumed that there were three fundamental stem types: (A) verbal stems, (B) nominal (and adjectival) stems, and (C) pronominal and indeclinable stems. Some stems were exclusively nominal. In the majority of cases, however, both verbal stems and nominal stems could be built from the same root. In Proto-Nostratic, only pronominal and indeclinable stems could end in a vowel (**CV*). Verbal and nominal stems, on the other hand, had to end in a consonant, though, as noted above, when the undifferentiated stems were used as real words in themselves, a "terminal vowel" had to be added to the stem. As explained in Chapter 17, the terminal vowels were morphologically significant. Adjectives did not exist as an independent grammatical category in Proto-Nostratic. Instead, intransitive verbs could function as "adjectives". Also,

"adjectives" were differentiated from nouns mainly by syntactical means — a noun placed before another noun functioned as an attribute to the latter.

No doubt, the similarity in form between denominative verbs and denominative nouns (both derived from noun stems: *C_1VC_2+C_{DS}-), on the one hand, and between deverbative verbs and deverbative nouns (both derived from verb stems: *C_1VC_2+V_{FV}+C_{DS}-), on the other hand, must have caused some confusion, resulting in a certain amount of restructuring in the various Nostratic daughter languages. This restructuring tends to make it difficult to discern the original patterning.

On the basis of evidence presented in this chapter (and Chapter 16), it appears that the following derivational suffixes are the ones that can most confidently be reconstructed for Proto-Nostratic:

Nominalizer: *-r-
Nominalizer: *-m-
Nominalizer: *-y-
Nominalizer: *-t^h-
Nominalizer: *-n-
Nominalizer: *-l-
Nominalizer: *-k^h-
Nominalizer: *-k'-

Notes:

1. The term "nominalizer" covers both deverbative and denominative nouns. Though highly speculative, we can venture a guess, mainly on the basis of the Afrasian, Dravidian, and Elamite evidence, at a more precise meaning for some of these suffixes:

   A. *-*r*- may have been used to form actor nouns;
   B. *-*m*- may have been used to form abstract nouns;
   C. *-*y*- may have been used to form deverbative nouns — it may also have been added to nouns to form attributives (cf. Ehret 1995:16 concerning the functions of this suffix in Afrasian: "[t]his suffix can operate as a noun-forming deverbative in Semitic, Egyptian, Chadic, and Cushitic instances, but is also often added to nominals to form attributives — names of things having the attribute(s) of, or associated by location or resemblance with, the item named by the stem to which *y is suffixed");
   D. *-*t*- may have been used to form generalized nouns;
   E. *-*n*- may have been used to form abstract nouns;
   F. *-*l*- may have been used to form deverbative nouns;
   G. *-k^h- exact meaning uncertain — perhaps deverbative;
   H. *-*k'*- exact meaning uncertain — perhaps diminutive.

2. Supporting data for these derivational suffixes are given in Chapter 16, IV. Derivational Suffixes, §§16.38—16.45.
3. Several of these suffixes are used in the daughter languages to form adjectives.

4. There must also have been a great variety of verb extensions. However, the data from the various Nostratic daughter languages are too divergent to allow these extensions to be reconstructed with certainty at the present time. But all is not lost — there are important clues as to what may have existed. As stated above, Militarëv (2005) reconstructs the following "fossilized formants" (= "derivational suffixes") for Proto-Semitic: **m*, **n*, **t*, **r*, **l*, **ʔ*, **b*, and **k* (and possibly **ħ*). Militarëv does not assign meanings, nor does he differentiate between nominal roots and verbal roots. Without a doubt, these "fossilized formants" go back not only to Proto-Afrasian but to Proto-Nostratic as well. Moreover, at the Proto-Nostratic level, these formants must have been fully productive derivational suffixes.

The fact that there are relatively few, if any, matches among several of the daughter branches (Kartvelian, Indo-European, Yukaghir, Chukchi-Kamchatkan, and Gilyak / Nivkh) indicates that most of their derivational morphology, though originally based upon the same principles, later developed independently and over a long period of time and was not directly inherited from Proto-Nostratic. In the case of Indo-European, the evidence from the Anatolian daughter languages provides explicit confirmation that this is exactly what has happened. But there is more: thanks to the work of Émile Benveniste (1935 and 1948), the most ancient Proto-Indo-European root structure patterning and derivational morphology have been recovered, and their Nostratic origins are unmistakable (cf. Chapter 17, §17.5). In the case of Chukchi-Kamchatkan, on the other hand, the grammaticalization of what were once independent forms has clearly occurred (on grammaticalization theory in general, cf. Fischer—Norde—Perridon [eds.] 2004; Haspelmath 1998; Heine—Claudi—Hünnemeyer 1991; Hopper—Traugott 1993 and 2003; B. Joseph 2004; C. Lehmann 2002 and 2015; Nurse—Kuteva 2002 and 2005).

Eskimo-Aleut presents unique challenges (cf. Fortescue 2004) and, therefore, has been left out of the above discussion. For a list of Proto-Eskimo postbases, cf. Fortescue—Jacobson—Kaplan 1994:393—438.

CHAPTER NINETEEN

PROTO-INDO-EUROPEAN MORPHOLOGY I: TRADITIONAL RECONSTRUCTION

19.1. INTRODUCTION

In this chapter, we will discuss traditional views on the reconstruction of the Proto-Indo-European morphological system. Several topics, such as root structure patterning, accentuation, and ablaut, have already been discussed in the chapters on phonology — some of that material will be repeated in this chapter. The next chapter will focus on an investigation of the possible prehistoric development of Proto-Indo-European morphology.

The traditional reconstruction of the Proto-Indo-European morphological structure represents the stage of development just before the emergence of the individual daughter branches. Prior to the discovery of Hittite and the other Indo-European languages of ancient Anatolia, the morphological system that was assumed to have existed in the Indo-European parent language closely resembled that of Classical Sanskrit and Ancient Greek. As the Hittite material began to be taken into consideration, the earlier views had to be modified, and many points are still being debated.

Morphologically, Proto-Indo-European was a highly inflected language — except for particles, conjunctions, and certain quasi-adverbial forms, all words were inflected. The basic structure of inflected words was as follows: root + suffix (one or more) + inflectional ending (see below for details). A notable morphophonemic characteristic was the extensive use of a system of vocalic alternations ("Ablaut" in German) as a means to mark morphological distinctions. Verbs were strongly differentiated from nouns. For nouns and adjectives, three genders, three numbers, and as many as eight cases have been reconstructed (mainly on the basis of what is found in Classical Sanskrit), though it is doubtful that all of these features were ancient — it is indeed possible to discern several chronological layers of development. The traditional reconstruction of the Proto-Indo-European verbal system sets up two voices, four moods, and as many as six tenses. Syntactically, Proto-Indo-European seems to have had many of the characteristics of an SOV language, though there must, no doubt, have been a great deal of flexibility in basic word order patterning. For details on Proto-Indo-European syntax, cf. Brugmann 1904:623—705; Clackson 2007:157—186; Fortson 2004:137—152 and 2010: 152—169; Paul Friedrich 1975; Lehmann 1975, 1993:187—207, and 2002:100—133; Meier-Brügger 2003:238—276 (by Matthias Fritz); Watkins 1977.

19.2. ROOT STRUCTURE PATTERNING IN PROTO-INDO-EUROPEAN

A shorter version of this section can be found in Chapter 4 (§4.10), "The Reconstruction of the Proto-Indo-European Phonological System".

Before beginning, it is necessary to define several key terms. A *root* may be defined as the base form of a word. It carries the basic meaning, and it cannot be further analyzed without loss of identity (cf. Crystal 2003:402). A *stem*, on the other hand, may be defined as an inflectional base. A stem may or may not be coequal with a root. Cf. Crystal 2003:433.

There have been several attempts to formulate the rules governing the structural patterning of roots in Proto-Indo-European. Without going into details, it may simply be noted that none of the proposals advanced to date has escaped criticism, including the theories of Émile Benveniste (1935:147—173, especially pp. 170—171). The problem is complicated by the fact that the form of Proto-Indo-European traditionally reconstructed — what I call "Disintegrating Indo-European" — is the product of a very long, largely unknown evolution. Disintegrating Indo-European contained the remnants of earlier successive periods of development.

For Disintegrating Indo-European, Jerzy Kuryłowicz's (1935:121) description is adequate (see also Szemerényi 1996:98—99):

> … the root is the part of the word (it is a question of only the simple word) made up of (1) the initial consonant or consonantal group, (2) the fundamental vowel, (3) the final consonant or consonantal group. — The final group can consist of no more than two consonantal elements, the first of which has greater syllabicity than the second. In other words, the first consonantal element is *i̯*, *u̯*, *r*, *l*, *n*, *m*, while the second is a consonant in the strictest sense of the term: stop, *s*, or laryngeal (*ə̯₁*, *ə̯₂*, *ə̯₃*).

Fortson (2004:70 and 2010:76) gives the following examples of Proto-Indo-European roots, arranged by structure (the notation has been modified to agree with what is used in this book) (cf. also Gamkrelidze—Ivanov 1995.I:185—189):

**CeC-*	**p*^{h}*et*^{h}*(H)-* 'to fly' (Fortson **pet-*)
	**p*^{h}*et'-* 'foot' (Fortson **ped-*)
	**d*^{h}*eg*^{w}^{h}*-* 'to burn' (Fortson **dheg*^{w}*h-*)
	**sew-* 'to press out juice' (Fortson **seu-*)
	**p'el-* 'strength' (Fortson **bel-*)
	**H*$_1$*es-* 'to be' (Fortson **h*$_1$*es-*)
	**t'oH*^{w}*-* 'to give' (Fortson **deh*$_3$*-*)
	**wes-* 'to buy, to sell' (Fortson **u̯es-*)
	**leg*^{h}*-* 'to lie down' (Fortson **legh-*)
	**sem-* 'one' (Fortson **sem-*)
**CReC-*	**d*^{h}*wer-* 'door' (Fortson **dhu̯er-*)
	**sneH*$_1$*-* 'to sew' (Fortson **sneh*$_2$*-*; Rix 1998a:520 **sneh*$_1$*-*)
	**t*^{h}*yek'*^{w}*-* 'to revere' (Fortson **ti̯eg*^{w}*-*)

*$swep^h$- ‘to sleep’ (Fortson *$s\underline{u}ep$-)
*$smey$- ‘to smile’ (Fortson *$smei$-)
*$k'noH$- ‘to know’ (Fortson *$\hat{g}neh_3$-)
*k^hlew- ‘to hear’ (Fortson *$\hat{k}leu$-)
*$srew$- ‘to flow’ (Fortson *$sreu$-)

*$CeRC$- *d^heyg^h- ‘to shape with the hands’ (Fortson *$dheig\hat{h}$-)
*$t'erk^h$- ‘to see’ (Fortson *$der\hat{k}$-)
*$melk'$- ‘to wipe’ (Fortson *$mel\hat{g}$-)
*$meld^h$- ‘to speak solemnly’ (Fortson *$meldh$-)
*$k'emb^h$- ‘to bite’ (Fortson *$\hat{g}embh$-)
*$Horb^h$- ‘to change social status’ (Fortson *h_3erbh-)
*$noHt^h$- ‘buttocks’ (Fortson *neh_3t-)

*$CReRC$- *g^hrend^h- ‘to grind’ (Fortson *$ghrendh$-)
*k^hrewH_2- ‘to gore’ (Fortson *$kreuh_2$-)
*$sweH_2t'$- ‘sweet’ (Fortson *$s\underline{u}eh_2d$-)
*$mlewH_2$- ‘to speak’ (Fortson *$mleuh_2$-)

Fortson (2004:71) also points out that a small number of roots began with a cluster consisting of two stops; he cites the following examples:

*t^hk^hey- ‘to settle’ (Fortson *$t\hat{k}ei$-)
*p^ht^her- ‘wing’ (Fortson *$pter$-)

A careful analysis of the root structure patterning led Benveniste to the discovery of the basic laws governing that patterning. According to Benveniste (1935:170—171), these laws may be stated as follows (see also Lehmann 1952:17—18):

1. The Proto-Indo-European root is monosyllabic, composed of the fundamental vowel *ĕ* between two different consonants.
2. In this constant scheme, consonant plus *e* plus consonant, the consonants can be of any order provided that they are different; however, the cooccurrence of both a voiceless stop and an aspirated voiced stop is forbidden.
3. The addition of a suffix to the root gives rise to two alternating stem types: Type I: root in full grade and accented, suffix in zero-grade; Type II: root in zero-grade, suffix in full-grade and accented.
4. A single determinative can be added to the suffix, either after the suffix of stem Type II, or, if *n*, inserted between the root element and the suffix of stem Type II.
5. Further addition of determinatives or suffixes points to a nominal stem.

Benveniste’s views are not necessarily incompatible with those of Kuryłowicz. These theories can be reconciled by assuming that they describe the root structure patterning at different chronological stages.

Now, comparison of Proto-Indo-European with the other Nostratic languages, especially Proto-Kartvelian and Proto-Afrasian, allows us to refine Benveniste's theories. The most ancient patterning was probably as follows:

1. There were no initial vowels in the earliest form of Pre-Proto-Indo-European. Therefore, every root began with a consonant.
2. Originally, there were no initial consonant clusters either. Consequently, every root began with one and only one consonant.
3. Two basic syllable types existed: (A) **CV* and (B) **CVC*, where *C* = any non-syllabic and *V* = any vowel. Permissible root forms coincided exactly with these two syllable types.
4. A verbal stem could either be identical with a root or it could consist of a root plus a single derivational morpheme added as a suffix to the root: **CVC-VC-*. Any consonant could serve as a suffix.
5. Nominal stems, on the other hand, could be further extended by additional suffixes.

In the earliest form of Proto-Indo-European, there were three fundamental stem types: (A) verbal stems, (B) nominal and adjectival stems, and (C) pronominal and indeclinable stems.

The phonemicization of a strong stress accent in Early Proto-Indo-European disrupted the patterning outlined above. The positioning of the stress was morphologically distinctive, serving as a means to differentiate grammatical relationships. All vowels were retained when stressed but were either weakened (= "reduced-grade") or totally eliminated altogether (= "zero-grade") when unstressed: the choice between the reduced-grade versus the zero-grade depended upon the position of the unstressed syllable relative to the stressed syllable as well as upon the laws of syllabicity in effect at that time. Finally, it was at this stage of development that the syllabic allophones of the resonants came into being.

The stress-conditioned ablaut alternations gave rise to two distinct forms of extended stems:

Type 1: Root in full-grade and accented, suffix in zero-grade: *CV́CC-.
Type 2: Root in zero-grade, suffix in full-grade and accented: *CCV́C-.

The following examples may be given to illustrate this patterning (cf. Benveniste 1935:151, 152, and 161; Gamkrelidze—Ivanov 1995.I:194—201; Lehmann 1952: 17):

Type 1: *CV́CC-		Type 2: *CCV́C-	
**p*^{h}*ér-k*^{h}-	Lithuanian *peršù* 'I woo, I pester'; Umbrian *persklum* (< **perk-sk-lo-*) 'prayer'	**p*^{h}*r-ék*^{h}-	Latin *precor* 'to ask'
**t*^{h}*ér-H*$_2$-	Hittite *tar-aḫ-zi* 'controls'	**t*^{h}*r-éH*$_2$-	Latin *intrāre* 'to enter'

*$g^héy$-m-	Greek χειμών ‘winter’; Sanskrit *hemantá-ḥ* ‘winter’; Lithuanian *žiemà* ‘winter’	*g^hy-ém-	Greek χιών ‘snow’; Latin *hiems* ‘winter’; Armenian *jiwn* ‘snow’; Avestan *zyå* ‘winter’
*$p^hét^h$-r/n-	Sanskrit *pátra-m* ‘wing, feather’; Old English *feðer* ‘feather’; Old Icelandic *fjöðr* ‘feather’; Old High German *fedara* ‘feather’; Hittite *pát-tar* ‘wing’	*p^ht^h-ér/n-	Greek πτερόν ‘wing, feather’, πτέρυξ ‘wing’
*t’éy-w-	Sanskrit *devá-ḥ* ‘deity, god’; Latin *deus* ‘god’; Lithuanian *diẽvas* ‘god’	*t’y-éw-	Sanskrit *dyáu-ḥ* ‘sky, heaven’
*$p^hél$-H_2-	Hittite *pal-ḫi-iš* ‘broad’	*p^hl-éH_2-	Latin *plānus* ‘even, level, flat’; Lithuanian *plónas* ‘thin’
*k’én-H_1-	Greek γένος ‘race, family, stock’	*k’n-éH_1-	Greek γνήσιος ‘of or belonging to the race, lawfully begotten’
*$p^hél$-H_2-	Greek πέλας ‘near, near by’	*p^hl-éH_2-	Greek πλησίον (Doric πλᾶτίον) ‘near, close to’

When used as a verbal stem, Type 1 could undergo no further extension. However, Type 2 could be further extended by means of a *determinative* (also called *extension* or *enlargement*). Further addition of a determinative or suffixes pointed to a nominal stem (cf. Benveniste 1935:171; Lehmann 1952:17). According to Benveniste (1935:148), a *suffix* was characterized by two alternating forms (*-*et*-/*-*t*-, *-*en*-/*-*n*-, *-*ek*-/*-*k*-, etc.), while a *determinative* was characterized by a fixed consonantal form (*-*t*-, *-*n*-, *-*k*-, etc.). Benveniste further (1935:164) notes:

> … in the numerous cases where the initial [consonant group has been reconstructed in the shape] **(s)k*-, **(s)t*-, **(s)p*-, etc., with unstable sibilant, it is generally a question of prefixation, and it may be observed that the root begins with the [plain] consonant [alone excluding the sibilant].

The German word *Ablaut* refers to the alternation of vowels in a given syllable. In the earliest form of Proto-Indo-European, ablaut was merely a phonological alternation. During the course of its development, however, Proto-Indo-European gradually grammaticalized these ablaut alternations. For information on ablaut, cf. Chapter 4, §§4.8—4.9; Beekes 2011:174—177; Brugmann 1904:138—150; Hirt 1900; Fortson 2010:79—83; Fulk 1986; Gamkrelidze—Ivanov 1995.I:131—167; Hübschmann 1885; Meier-Brügger 2003:144—152; Meillet 1964:153—168; Schmidt-Brandt 1973; Szemerényi 1996:83—93; Watkins 1998:51—53.

Undifferentiated roots could serve as nominal stems (these are called *root nouns*), though the majority of nominal stems were derived from roots by the

addition of determinatives and/or suffixes (these are called *derived nouns*) (cf. Szemerényi 1996:163; Beekes 2011:179—183). There was considerable variety in the determinatives/suffixes, though several were more frequently used than others. In later Proto-Indo-European, stems ending in a thematic vowel, in particular, became increasingly common, while heteroclitic stems had started to decline as a productive category — they are best preserved in Hittite. In the majority of cases, it is not possible to discern any difference in meaning or function among the determinatives/suffixes, though several of them had developed specialized functions. Benveniste devotes an entire book (1935) to the study of the origins of the formation of nouns in Proto-Indo-European — Chapter X on the structure of the most ancient nominal derivations is particularly important. He elaborates on his views in his 1948 book on agent nouns and action nouns in Proto-Indo-European.

Proto-Indo-European had constraints on permissible root structure sequences (cf. Fortson 2004:54, 72, and 2010:59, 78; Meillet 1964:173—174; Szemerényi 1996:99—100; Watkins 1998:53) — Szemerényi (1996:99) lists the following possible and impossible root structure types (his notation has been retained):

Possible	Impossible
1. Voiced-voiced aspirate (**bedh*-)	I. Voiced-voiced (**bed*-)
2. Voiced-voiceless (**dek*-)	II. Voiced aspirate-voiceless (**bhet*-)
3. Voiced aspirate-voiced (**bheid*-)	III. Voiceless-voiced aspirate (**tebh*-); III is, however, possible after **s*-: **steigh*- ‘to go up’
4. Voiced aspirate-voiced aspirate (**bheidh*-)	
5. Voiceless-voiced (**ped*-)	
6. Voiceless-voiceless (**pet*-)	

In terms of the radical revision of the Proto-Indo-European consonant system proposed by Gamkrelidze, Hopper, and Ivanov, these constraint laws may be restated as follows (cf. Hopper 1973:158—161, §3.2.6; Gamkrelidze 1976:404—405 and 1981:608—609):

1. Each root had to contain at least one non-glottalic consonant.
2. When both obstruents were non-glottalic, they had to agree in voicing.

The Proto-Indo-European root structure constraint laws thus become merely a voicing agreement rule with the corollary that two glottalics cannot cooccur in a root. Comparison with the other Nostratic languages indicates, however, that the forbidden root types must have once existed. Two rules may be formulated to account for the elimination of the forbidden types:

1. A rule of progressive voicing assimilation may be set up to account for the elimination of roots whose consonantal elements originally did not agree in voicing: **T* ~ **B* > **T* ~ **P*, **B* ~ **T* > **B* ~ **D*, etc.

2. A rule of regressive deglottalization may be set up to account for the elimination of roots containing two glottalics: **C'VC'-* > **CVC'-*. This rule finds a close parallel in Geers' Law in Akkadian (cf. Ungnad—Matouš 1969:27).

According to Gamkrelidze (1976:405 and 1981:608), Bartholomae's Law is a later manifestation of the progressive voicing assimilation rule, applied to contact sequences (for details on Bartholomae's Law, cf. Szemerényi 1996:102—103; Collinge 1985:7—11 and 263—264; Burrow 1973:90).

A notable feature of Proto-Indo-European root structure patterning was the use of *reduplication* (cf. Brugmann 1904:286—287; Gamkrelidze—Ivanov 1995. I:189—191; Beekes 2011:183; Meillet 1964:179—182). Two main types of reduplication occurred: (1) partial (also called "normal" reduplication) and (2) full (also called "intensive" reduplication). In partial reduplication, only the initial consonant of the root was repeated: **CV-CVC-* (cf. Homeric γέ-γον-ε 'was born', Sanskrit *ja-já́n-a* 'gave birth'). When the root began with a consonant cluster, the cluster was simplified in the reduplicated syllable (cf. Greek πί-πλη-μι 'I fill'). In full reduplication, the entire root was repeated: **CVC-CVC-* (cf. Sanskrit *vár-var-ti* 'turns', Avestan *zao-zao-mi* 'I call', Hittite *ḫu-ul-ḫu-li-ya-* 'to entwine, to embrace; to wrestle, to struggle').

As noted by Beekes (2011:173), neither preverbs nor prepositions nor postpositions existed as such in Proto-Indo-European. Instead, Proto-Indo-European had adverbs (which later became preverbs, prepositions, or postpositions in the individual daughter languages).

Finally, it must be noted that a number of roots could also be optionally preceded by **s-* (cf. Meillet 1964:171—172; Brugmann 1904:195, note 3; Beekes 2011:172). Inasmuch as such roots sometimes occur with and sometimes without the initial **s-*, this element is called "*s*-mobile", "mobile *s*", or "movable *s*". Fortson (2004:71—72 and 2010:76—77) gives the following examples (the parentheses indicate that the initial **s-* may or may not occur): **(s)p^{h}ek^{h}-* 'to see', **(s)t^{h}ek'-* 'to cover', **(s)neyg^{wh}-* 'snow', **(s)rew-* 'to flow', **(s)t^{h}renk^{h}-* 'tight'. As noted by Burrow (1973:81), no theory has yet been proposed that can satisfactorily account for this variation, but he further remarks:

> Most probably it is the result of some kind of external sandhi affecting initial *s-* in the Indo-European period. It seems fairly clear that the phenomenon is due to loss of initial *s*, and if this is so the theory that would regard the *s* as the remains of some kind of prefix is out of the question.

Burrow's statement is contrary to the views of Benveniste (1935:164), who regards the *s* as the remains of some kind of prefix (see quotation above). Szemerényi (1996:94) mentions both of these theories without deciding which offers the more probable explanation. Fortson (2010:76—77) mentions neither theory. Lehmann (1993:135—136), on the other hand, supports Burrow, as do I. Gamkrelidze—Ivanov (1995.I:102—104) stand alone in positing a separate phoneme, which they write **ŝ*, to account for examples of "movable *s*" in the daughter languages.

19.3. OVERVIEW OF NOUNS AND ADJECTIVES

Proto-Indo-European distinguished nouns and adjectives. The adjectives had essentially the same inflection as nouns (cf. Beekes 2011:173; Meillet 1964:254; Meier-Brügger 2003:187—188; Szemerényi 1996:155). In some cases, adjectives were derived from nouns by means of possessive suffixes (such as *-*yo*-, for example). Demonstrative pronouns and numerals are also usually classed with nouns and adjectives.

In the latest period of development, the gender of nouns was fixed (as either masculine, feminine, or neuter) — adjectives, on the other hand, had no fixed gender but agreed in gender and number with the nouns they modified (cf. Szemerényi 1996:192—193). Nouns were also characterized by three numbers (singular, dual, and plural) and a set of case endings (as many as eight cases are traditionally reconstructed [cf. Szemerényi 1996:159] — nine, if we allow for the possibility of a directive or allative case as some have suggested [cf. Fortson 2004: 102 and 2010:113; Haudry 1979:36; Watkins 1998:65]). The following cases are traditionally reconstructed:

1. Nominative: subject of verbs (both transitive and intransitive)
2. Vocative: direct address
3. Accusative: direct object
4. Genitive: possession (“of, belonging to”)
5. Dative: indirect object (“to, for”)
6. Ablative: source of movement (“from”)
7. Locative: place in, on, or at which something occurs (“in, on, at”)
8. Instrumental: means by which something is done (“with, by [means of]”)
9. (Allative/directive: goal or direction of an action or a motion; motion to or towards [“to, toward(s), in the direction of”])

The nominative and vocative singular, dual, and plural and the accusative singular and dual are known as *strong* cases, while the remaining cases are known as *weak* cases (also called *oblique* cases). In Early Proto-Indo-European, the accent was on the stem in the strong cases, which also had a full-grade (or lengthened-grade) vowel, while in the weak cases, the accent was shifted to the suffix or to the case ending (with a corresponding shift in full-grade vowel) (cf. Burrow 1973:220). During the earlier period of development, the accent shift typically resulted in the reduction or loss of the vowel of the unaccented syllable, unless such a reduction or loss would have resulted in unpronounceable consonant clusters (cf. Burrow 1973:220). In later Proto-Indo-European, there was a tendency to level out the paradigm, either in terms of accent or vowel grade or both, though enough traces of the older patterning remained in the later stages of development so that it is possible to discern its underlying characteristics.

An important distinction must be made between *thematic* stems and *athematic* stems. Thematic stems ended in a so-called “thematic vowel” (*-*e/o*-), while athematic stems did not end in such a vowel (cf. Fortson 2010:83—85 and 126).

Finally, mention must be made of a special type of declension in which the nominative-accusative singular is characterized by *-*r*-, while the remaining cases are characterized by *-*n*-. Nouns exhibiting this patterning are known as *heteroclitic stems*. Though common in Hittite, this declensional type was in decline in the other daughter languages (cf. Fortson 2004:110—111, 165, and 2010:123, 181—182; Kloekhorst 2008b:108—109). For details on heteroclitic stems, cf. Szemerényi 1996:173; Burrow 1973:226—229. The following examples illustrate the general patterning:

	Nominative Singular	Genitive Singular
Hittite	*wa-a-tar* 'water'	*ú-i-te-na-aš*
	pa-aḫ-ḫur, *pa-aḫ-ḫu-wa-ar* 'fire'	*pa-aḫ-ḫu-e-na-aš*
	e-eš-ḫar, *e-eš-ḫa-ar*, *iš-ḫar* 'blood'	*iš-ḫa-na-aš*
	ut-tar 'word, affair'	*ud-da-na-aš*
	me-ḫur 'time'	*me-(e-)ḫu-na-aš*
Sanskrit	*yákṛt* 'liver'	*yaknás*
	áhar 'day'	*ahnás*
	ū́dhar 'udder'	*ū́dhnas*
	ásṛk 'blood'	*asnás*
	śákṛt 'dung'	*śaknás*
Greek	ὕδωρ 'water'	ὑδατός (< **ud-n̥-to-s*)
	οὖθαρ 'udder, breast'	οὔθατος (< **ōudh-n̥-to-s*)
Latin	*femur* 'thigh'	*feminis* (also *femoris*)
	iecur 'liver'	*iocineris* (also *iecoris*)

Notes:
1. The *-t* and *-k* that have been added to the nominative singular in Sanskrit are innovations.
2. In Greek, -το- has been added to the "oblique-*n*", which is in the reduced-grade (*-*n̥*- > -α-).

19.4. NOMINAL INFLECTION

As noted above, nouns were inflected for number and case, while adjectives were also inflected for gender in Proto-Indo-European. Inasmuch as their gender was fixed, nouns were not inflected for gender. Gender in Proto-Indo-European was grammatical and might or might not have accorded with natural gender. In the Anatolian branch, masculine and feminine did not exist as separate gender classes; rather, there was a combined common gender, which included both masculine and feminine (see below). Different sets of case endings must be reconstructed for athematic stems, on the one hand, and for thematic stems, on the other hand. In thematic stems, the case endings were added after the thematic vowel *-*e/o*-.

The Proto-Indo-European athematic case endings may be reconstructed as follows (cf. Adrados 1975.I:329; Adrados—Bernabé—Mendoza 1995—1998.II: 45—94; Beekes 1995:172—195 and 2011:185—217; Brugmann 1904:373—399; Burrow 1973:230—242; Clackson 2007:92—100; Fortson 2004:113—116 and 2010:126—129; Fulk 2018:141—180; Haudry 1979:34—37; Kapović 2017c:63—67; Kulikov 2011:290; Lehmann 1993:144—146; Lundquist—Yates 2018:2083; Meier-Brügger 2003:195—199; Meillet 1964:292—300; Schmalstieg 1980:46—87; Schmitt-Brandt 1998:180—220; Shields 1982; Sihler 1995:248—256; Szemerényi 1996:157—192; Watkins 1998:65—66 [the preceding references are for both athematic and thematic endings]):

Case	Masculine/feminine	Neuter
Singular:		
Nominative	**-s*	
Nominative-accusative		**-Ø*
Vocative	**-Ø*	
Accusative	**-m̥/-m* (or **-n̥/-n*)	
Genitive-ablative	**-es/-os/-s*	**-es/-os/-s*
Dative	**-ey*	**-ey*
Locative	**-i*, **-Ø*	**-i*, **-Ø*
Instrumental	**-(e)H_1*	**-(e)H_1*
(Directive/allative)	(**-oH*)	(**-oH*)
Dual:		
Nominative-accusative	**-H_1(e)*	**-iH_1*
Genitive	**-oH_1s* (?), **-ows* (?)	**-oH_1s* (?), **-ows* (?)
Dative	**-b^hyō* (?), **-mō* (?)	**-b^hyō* (?), **-mō* (?)
Locative	**-ow* (?)	**-ow* (?)
Instrumental	**-b^hyō* (?), **-mō* (?)	**-b^hyō* (?), **-mō* (?)
Plural:		
Nominative-vocative	**-es*	
Nominative-accusative		(collective **-(e)H_4*)
Accusative	**-m̥s/-ms* or **-n̥s/-ns*	**-m̥s/-ms* or **-n̥s/-ns*
Genitive	**-ŏm*	**-ŏm*
Locative	**-su/-si*	**-su/-si*
Dative-ablative	**-b^h(y)os*, **-mos*	**-b^h(y)os*, **-mos*
Instrumental	**-b^hi(s)*, **-mi(s)*	**-b^hi(s)*, **-mi(s)*

The above table is a composite and aims to be as comprehensive as possible. Some of the reconstructions are more certain than others — the dual and plural oblique endings are particularly controversial, and there is considerable disagreement among different scholars here.

The thematic case endings may be reconstructed as follows:

Case	Masculine/feminine	Neuter
Singular:		
Nominative	*-*o*-*s*	
Nominative-accusative		*-*o*-*m*
Vocative	*-*e*	
Accusative	*-*o*-*m* (or *-*o*-*n*)	
Genitive	*-*o*-*s(y)o*	*-*o*-*s(y)o*
Ablative	*-*ōt^h* (< *-*o*-*H$_1$(e)t^h*)	*-*ōt^h* (< *-*o*-*H$_1$(e)t^h*)
Dative	*-*ōy* (< *-*o*-*ey*)	*-*ōy* (< *-*o*-*ey*)
Locative	*-*e/o*-*y*	*-*e/o*-*y*
Instrumental	*-*e/o*-*H$_1$*	*-*e/o*-*H$_1$*
(Directive/allative)	(*-*ōH* [< *-*o*-*oH*])	(*-*ōH* [< *-*o*-*oH*])
Dual:		
Nominative-accusative	*-*oH$_1$*, *-*oy*	*-*oH$_1$*, *-*oy*
Genitive	*-*oH$_1$os* (?)	*-*oH$_1$os* (?)
Dative	*-*o*-*b^{h}yō(m)* (?), *-*o*-*mō* (?)	*-*o*-*b^{h}yō(m)* (?), *-*o*-*mō* (?)
Locative	*-*ow* (?)	*-*ow* (?)
Instrumental	*-*o*-*b^{h}yō(m)* (?), *-*o*-*mō* (?)	*-*o*-*b^{h}yō(m)* (?), *-*o*-*mō* (?)
Plural:		
Nominative-vocative	*-*ōs* (< *-*o*-*es*)	
Nominative-accusative		*-*e*-*H$_4$*
Accusative	*-*ōns* (< *-*o*-*ons*) (or *-*ōms* [< *-*o*-*oms*])	*-*ōns* (< *-*o*-*ons*) (or *-*ōms*)
Genitive	*-*ōm* (< *-*o*-*om*)	*-*ōm* (< *-*o*-*om*)
Locative	*-*oysu/-oysi*	*-*oysu/-oysi*
Dative-ablative	*-*o*-*b^h(y)os*, *-*o*-*mos*	*-*o*-*b^h(y)os*, *-*o*-*mos*
Instrumental	*-*ōys* (< *-*o*-*oys*), *-*o*-*mis*	*-*ōys* (< *-*o*-*oys*), *-*o*-*mis*

In the non-Anatolian daughter languages, the most complete declensional system is found in Indo-Iranian, where all eight cases are represented. Baltic has seven cases (the genitive and ablative have merged). Sabinian also has seven cases, as does Umbrian (counting the vocative), while Oscan has six, as does Classical Latin (counting the vocative), and Literary Greek has five, as does Gothic (counting the vocative). The dual is found in the early stages of several branches and is still represented in modern Lithuanian, Slovenian, Sorbian, and Icelandic (albeit serving as plural forms in the colloquial language), though, in general, it has been lost. Cf. Sihler 1995:246.

19.5. NOMINAL INFLECTION IN ANATOLIAN

Nominal inflection in the Anatolian daughter languages differs in many respects from what is given above. First, there is no feminine gender (cf. Lehmann 1993:150). Instead, there is a two gender system consisting of a common gender and a neuter gender (cf. Sturtevant 1951:82—83; Kronasser 1956:97 and 1966.1:106; Luraghi 1997:7 and 1998:177; Laroche 1959:135; Werner 1991:25; Carruba 1970:41). The common gender corresponds to both the masculine and feminine genders of the other Indo-European daughter languages. There is no trace of a dual number. There is evidence (in Old Hittite) for the existence of a directive or allative case (cf. Hoffner—Melchert 2008:76; Held—Schmalstieg—Gertz 1988:26; Luraghi 1997:13). The singular is more complete than the plural (cf. Sturtevant 1951:83; Luraghi 1997:8 and 1998:179—180). The heteroclitic stems are more widespread. The thematic stems are far less prominent. These differences can be accounted for in several ways. First, the common gender clearly represents an earlier stage of development in which the feminine had not yet developed. The same may be said of the dual number. Here, it is not a question of loss — there is absolutely nothing to indicate that the dual ever existed at any point in the Anatolian branch (cf. Sihler 1995:246; Fortson 2004:156 and 2010:172—173; Lehmann 1993:151). The fact that heteroclisis is still an active process in Anatolian, while it is in decline in the non-Anatolian daughter languages, also points to a more archaic stage of development. The fact that the plural is less well developed than the singular could be due either to loss or to the fact that the plural may not yet have been fully filled out. There are several features unique to the Luwian branch, in particular, that are certainly innovations (such as the thematic genitive singular ending and the thematic plural endings). We will look into these differences in more detail later.

I. Athematic case endings: we may use *(t)t*-stems (and *-nt*-stems) to illustrate the general patterning of athematic case endings (cf. Meriggi 1980:304; Hoffner—Melchert 2008:105—131, especially 121—123; Sturtevant 1951:100—101; J. Friedrich 1960.I:52 and I:53; Kronasser 1956:128—131; Luraghi 1998:177—180; Neu 1979; Carruba 1970:41—43; Laroche 1959:135—140; Gusmani 1964:35—40; Werner 1991:29; Watkins 2004:560):

Singular	Hittite	Palaic	Luwian	Hiero.	Lycian	Lydian
Nom. (c.)	*-az*	*-az*, *-za*	*-az*	*-zas*	*-s* (?)	
Acc. (c.)	*-attan*		*-atan*	*-zan*		*-tn*
Nom.-Acc. (n.)	*-at*		*-i*			
Genitive	*-attaš*			*-tas*, *-tis*		
Dat.-Loc.	*-atti*, *-itti*	*-az*, *-za*	*-ati* (?)	*-ti*	*-ti* (?)	*-tλ* (?)
Ablative	*-az*, *-za*			*-tati*		
Instrumental	*-ita*					

Plural	Hittite	Palaic	Luwian	Hiero.	Lycian	Lydian
Nom. (c.)	*-tt]uš, -(i)ttaš, -ittiyaš, -nteš*					
Acc. (c.)	*-adduš*					
Nom.-Acc. (n.)	*-atta*, *-nta*					
Genitive	*-attan*, *-attaš*					
Dative	*-attaš*					

Notes:
1. In Hittite, Palaic, and Cuneiform Luwian, graphemic <z> = /t͡s/.
2. In Hittite, Palaic, and Cuneiform Luwian, graphemic <š> = /s/.
3. For Palaic, the endings cited are for *ḫa-ša-(a-)(u-)wa-an-za* and *Ti-ya-az* (cf. Carruba 1970:55 and 75).
4. The Hieroglyphic Luwian forms are for *-nt*-stems.

II. Thematic case endings (cf. Meriggi 1980:275; J. Friedrich 1960.I:45—46 [see also the table of case endings on p. 43]; Hoffner—Melchert 2008:79—85; Sturtevant 1951:91—92 [overall discussion of the case endings on pp. 84—91]; Kronasser 1956:99—109 [summary on p. 108]; Luraghi 1997:15—16 [table of case endings on p. 15] and 1998:177—180 [table of case endings on p. 178]; Carruba 1970:41—43; Werner 1991:27; Laroche 1959:135—140 [table of case endings on p. 137]; Gusmani 1964:35—40; Watkins 2004:560):

Singular	Hittite	Palaic	Luwian	Hiero.	Lycian	Lydian
Nom. (c.)	*-aš*	*-aš*	*-aš*	*-as*	*-a*	*-aś*
Acc. (c.)	*-an*	*-an*	*-an*	*-an*	*-ã*, *-u*	*-av*
Vocative	*-Ø*	*-a*	*-a*			
Nom.-Acc. (n.)	*-an*			*-aza*	*(-a)*	*-ad*
Genitive	*-aš*	*-aš*	*-ašši*, *-alli*	*-assa/i-*	*-asi* > *-ahi*	*-ali*
Dat.-Loc.	*-i*, *-ya*	(Dat.) *-i*	*-a(i)*	*-a*, *-aya*	*-i*, *-a*	*-aλ*
Ablative	*-az(a)*	*-az*	*-ati*	*-ati*	*-adi, -edi*	*-ad*
Instrumental	*-it*	*-az*	*-ati*	*-ati*	*-adi, -edi*	*-ad*
Directive	*-a*	(Loc.) *-a*				

Plural	Hittite	Palaic	Luwian	Hiero.	Lycian	Lydian
Nom. (c.)	*-e/iš*	*-uš*	*-anzi*	*-a(n)zi*		
Acc. (c.)	*-uš*		*-anza*	*-a(n)zi*	(Milyan) *-ãz*, *-uz*	
Nom.-Acc. (n.)	*-a*		*-a*	*-a*, *-aya*	*-iya*	*-a*
Genitive	*-an*, *-aš*				*-ãi*	
Dative	*-aš*		*-anza*	*-a(n)zi*	*-(iy)a*, *-(iy)e*	*-av*
Ablative	*-az(a)*		*-anzati*		*-a/ede* (?)	
Instrumental	*-it*		*-anzati*		*-a/ede* (?)	

Notes:

1. The Hittite case endings are for Old Hittite (for details on the case endings in Hittite, as well as nominal declension in general, cf. J. Friedrich 1960.I:42—59; Held—Schmalstieg—Gertz 1988:12—26; Hoffner—Melchert 2008:79—131; Kronasser 1956:97—139; Luraghi 1997:15—22; Sturtevant 1933:161—178 and 1951:81—101; Van den Hout 2011).
2. The Hittite ablative and instrumental plural endings are identical to the singular endings for these cases.
3. The genitive singular has been replaced in the Luwian branch (Cuneiform and Hieroglyphic Luwian and Lycian) by a suffix of adjectival origin (cf. Luraghi 1998:179).
4. In the Luwian branch, the plural endings are most likely based upon the accusative plural ending **-ons* (or **-n̥s*) reconstructed for Proto-Indo-European on the basis of the evidence of the non-Anatolian daughter languages (cf. Melchert 1994b:278 and 323; Luraghi 1998:177).
5. In the Lycian genitive singular, the *-ahi* form is found in Lycian, while the more archaic *-asi* form is found in Milyan.

19.6. COMMENTS ON NOMINAL INFLECTION

GENDER: The feminine gender reconstructed for Proto-Indo-European on the basis of the evidence of the non-Anatolian daughter languages is generally assumed to be a late development, which appeared after the Anatolian branch had split off from the main speech community (cf. Comrie 1998:82; Kuryłowicz 1964:207; Szemerényi 1996:156; Beekes 2011:189; Lehmann 1993:160; Shields 1982:14; Haudry 1982:72). Now, the similarity in form between the Late Proto-Indo-European feminine ending **-e-H_4* (> **-ā*) and the collective ending **-e-H_4* (> **-ā*) has been noted by several Indo-Europeanists, and there has been some speculation that the two may somehow be related (cf. Fortson 2010:133—134; Lehmann 1993:152; Shields 1982:72—81; Watkins 1998:63). Watkins (1998:63) makes an important point in noting that both feminine and collective function occurs in the

more widely attested ending *-*i*-H_4 (> *-*ī*) as well. As noted by Lehmann (1993:152), the common element here is the laryngeal and not the vowel. That the collective function of *-*e*-H_4 is ancient is indicated by the fact that it is found in Hittite, where it appears as -*a*. Curiously, and importantly, in Anatolian, Greek, and Gatha Avestan, neuter plurals took singular verb agreement (cf. Beekes 1985:28; Fortson 2010:131—132; Watkins 1998:63; Meillet 1964:291—292; Luraghi 1997:8 [for Hittite]). The following scenario may be proposed: The thematic declension ending *-*e*-H_4 was originally a collective with the meaning 'group of …', as in Hittite (nom.-acc. pl. n. [= collective]) *alpa* '(group of) clouds' (besides regular plural *alpeš*, *alpuš* 'clouds'), Greek (collective) μῆρα '(group of) thighs' (besides regular plural μηροί 'thighs'), and Latin *loca* '(group of) places' (besides regular plural *locī* 'places') (examples from Fortson 2010:131—132). The lack of a laryngeal reflex in Hittite points to *H_4 as the laryngeal involved here (cf. Sturtevant 1951:91 [Sturtevant writes *-*eh*]; Kuryłowicz 1964:217 [Kuryłowicz writes *$\underset{\sim}{ə}_4$]). It was accompanied by singular verbs, whereas the regular plural forms were accompanied by plural verbs. Inasmuch as it took singular verb agreement, it was partially reinterpreted as a nominative(-accusative) singular ending in early post-Anatolian Proto-Indo-European (cf. Lehmann 1993:150; J. Schmidt 1889; Gamkrelidze—Ivanov 1995.I:246). Later, an independent accusative singular was formed on the analogy of the thematic accusative singular ending *-*o*-*m* : *-*eH*$_4$+*m* (> *-*ā*-*m* [cf. Sanskrit acc. sg. *sénām* 'army', *kanyàm* 'girl']). The fact that there were two competing thematic nominative singular endings (*-*o*-*s* ~ *-*e*-H_4) brought about a split in which *-*os* was reinterpreted as a masculine marker and *-*eH*$_4$ as a feminine marker. A new, specifically feminine declension was then built around the nominative singular ending *-*eH*$_4$. The final change that took place was the analogical extension of this patterning to *-*i*-H_4 (and *-*u*-H_4) stems, which are feminine in the older non-Anatolian daughter languages (cf. Shields 1982:80). We should note that the *-*o*-*s* declension remained the default when no specific gender was indicated, and that a few archaisms have survived into the non-Anatolian daughter languages in which the *-*o*-*s* declension is used for both masculine and feminine — an example here would be Greek θεός, meaning both 'god' and 'goddess' (beside the specifically feminine form θεά 'goddess'). In some cases, the *-*o*-*s* declension was even used with feminine nouns, such as **snusó*-*s* 'daughter-in-law' (cf. Greek νυός 'daughter-in-law' and Armenian *nu* 'daughter-in-law', Latin *nurus* 'daughter-in-law', but not Sanskrit, which has *snuṣā́* 'daughter-in-law). Nonetheless, the majority of *-*o*-*s* stems were masculine. Thus, it emerges that the system of two genders found in the Anatolian languages represents a more archaic state of affairs (cf. Gamkrelidze—Ivanov 1995.I:328—329; Matasović 2004). It was replaced in post-Anatolian Proto-Indo-European by a system of three genders (cf. Beekes 2011:189; Brugmann 1897; Luraghi 2011; Szemerényi 1996:156). One additional remark is needed here: as I see the situation, the abstract nominal stems in *-*VH*$_2$ played no part whatsoever in the development of distinct feminine forms. It was only after a feminine had already been formed and laryngeals had been lost that a superficial resemblance between the two materialized.

We may close by making one final remark about gender. Above, the two genders found in the Anatolian languages were called *common* and *neuter*. It is clear that the distinguishing characteristic was animacy. Consequently, better terms would be *animate* and *inanimate* (cf. Haudry 1979:33; Luraghi 1997:8; Meier-Brügger 2003:188—189; Meillet 1982:211—228; Shields 1982:14).

NUMBER: The dual reconstructed for Late Proto-Indo-European on the basis of the evidence found in the non-Anatolian daughter languages is controversial. Indeed, some scholars have questioned whether a dual should even be reconstructed at all for Proto-Indo-European. However, it appears likely that the rudiments of a dual had already started to form in later Proto-Indo-European. That the process was not complete before the parent language began to disintegrate into different dialect groups is shown by the fact that the endings, especially those for the oblique cases, differ in important details among the various daughter languages. In other words, it was left to the individual daughter languages to fill out the paradigm (cf. Meier-Brügger 2003:190). This being the case, it is easy to understand why it is virtually impossible to reconstruct a common Proto-Indo-European set of dual endings that can account for all of the developments in the various daughter languages. The reconstructions given in the above tables are taken mainly from Szemerényi (1996:160 and 186). Szemerényi's reconstructions are based almost exclusively on what is found in Indo-Iranian (especially Old Indic). Other scholars have proposed either different reconstructions or none at all. That there are uncertainties about the reconstructions given in the above tables is indicated by the question marks. Some of the daughter languages did not carry the process of creating a full set of dual endings very far and eventually dropped the dual altogether, while others (notably Indo-Iranian) built quite elaborate systems. Here, again, the Anatolian languages represent a more archaic state of affairs in which the dual had not yet developed.

The singular and plural were well established in all stages of development of the Indo-European parent language. However, the system of plural case endings was less well developed than the corresponding system of singular endings (cf. Gamkrelidze—Ivanov 1995.I:244—245; Szemerényi 1996:159) — this is especially clear in Hittite (cf. Sturtevant 1951:83; Fortson 2010:182; Luraghi 1997:8 and 1998:179—180). In the non-Anatolian daughter languages, the plural (and dual) system was filled out, in part, by the incorporation of endings based on **-b^h(y)o-* ~ **-b^hi-* (in Indo-Iranian, Greek, Armenian, Italic, Venetic, and Celtic) and **-mi-* ~ **-mo-* (in Germanic and Balto-Slavic) (cf. Gamkrelidze—Ivanov 1995.I:332—335; Meillet 1964:298; Shields 1982:50—52; Fortson 2010:129; Lehmann 2002:184), both of which were originally independent particles, and both of which still exist in Germanic: (1) **me-t^hí* 'with, along with, together with' (> Proto-Germanic **miði* 'with, along with, together with' > Gothic *miþ* 'with, among'; Old Icelandic *með* 'with, along with, together with'; Old English *mid*, *miþ* 'together with, with, among'; Old Frisian *mithi* 'with'; Old Saxon *midi* 'with'; Middle High German *mite*, *mit* 'with, by, together' [New High German *mit*]); but **me-t^há* in Greek μετά '(with gen.) in the midst of, among; (with dat.) among, in the company of; (with acc.) into the middle of, coming among'; and (2) **b^hi-* 'in, with,

within, among' (> Proto-Germanic **bi* '[near] by, at, with, in, on, about' > Gothic *bi* 'about, over; concerning, according to; at'; Old English *be*, *bi*; *bī* [preposition, with dat., indicating place and motion] 'by [nearness], along, in'; Old Saxon *be-*, *bī-* 'by, about, in, on'; Old High German *bi-*; *bī* adverb indicating nearness, preposition meaning [with dat.] '[near] by, at, with', as adverb 'from now on [von jetzt an]' [New High German *bei*]). There is a compound in Sanskrit, namely, *abhí* (either < **e-/o-*+b^h*í-* or **m̥-*+b^h*í-*), whose primary meaning is 'moving or going towards, approaching' — as an independent adverb or preposition, it means (with acc.) 'to, towards, in the direction of, against, into'; as a prefix, it means 'to, towards, into, over, upon'. Another compound is found in Greek ἀμφί (**m̥-*+b^h*í-*), preposition used with the genitive, dative, and accusative with the basic meaning 'on both sides', as opposed to περί, whose basic meaning is 'all around' — (with gen., causal) 'about, for, for the sake of', (of place) 'about, around'; (with dat., of place) 'on both sides of, about'; (with acc., of place) 'about, around'; (as independent adverb) 'on both sides, about, around'. This compound is also found in the Latin inseparable prefix *amb-*, *ambi-*, meaning 'on both sides; around, round about'.

CASE ENDINGS: A more comprehensive analysis of the prehistoric development of the case endings will be undertaken in the next chapter. Here, we will make some preliminary observations concerning the traditional reconstructions.

A comparison of the case endings found in the Anatolian branch with those traditionally reconstructed indicates that, while there was a basic core of endings common to all branches, both Anatolian and non-Anatolian, the nominal inflectional system had not yet been completely filled out by the time that the Anatolian languages split off. It was very much a work in progress (cf. Lehmann 1993:153—155 and 2002:202). We have already seen that the feminine gender, the dual number, and the case endings based upon *-b^h*(y)o-* ~ *-b^h*i-* and **-mi-* ~ **-mo-* arose after the split. Moreover, we can no longer assume, as did the Neogrammarians, that, if something existed in Indo-Iranian, it must also have existed in the Indo-European parent language. Of late, there has been a growing recognition on the part of specialists that the complex inflectional system of Indo-Iranian was partially due to special developments in that branch, and the same may be said for some of what is found in Greek, Italic, Balto-Slavic, etc. (cf. Lehmann 1993:154—155). That said and done, the division between athematic and thematic declensional types was ancient.

The core case endings include the following: common (animate) gender nominative singular **-s* and accusative singular **-m* (and **-n*); genitive singular **-s*; dative-locative singular **-ey*/**-i*; nominative plural common gender **-es*; genitive plural **-om*; nominative-accusative neuter plural (= collective) **-(e)*H_4. According to Lehmann (2002:185), the earliest nominal declension consisted of the following three cases: nominative, accusative, and vocative. He further states that the genitive was probably the first additional case. The dative and locative singular endings appear to be ablaut variants (cf. Haudry 1979:35—36; Gamkrelidze—Ivanov 1995.I:249; Lehmann 2002:186), though a relationship between these two forms is disputed by some. A distinct ablative ending is found only in the thematic

declension (cf. Beekes 2011:212—213; Burrow 1973:233; Fortson 2010:127—128; Lehmann 2002:184; Szemerényi 1996:183—184; Weiss 2009:202) (cf. Sanskrit *-āt* [*-ād*]; Oscan *-ud*, -úd; Old Latin *-ē/ōd*; Cuneiform and Hieroglyphic Luwian *-ati*; Lycian *-adi*, *-edi*; Lydian *-ad*). The original form probably ended in **-t^h*, though this is not completely certain (cf. Burrow 1973:233; Kapović 2017c:64; Sihler 1995:250—251). This ending is best seen as an adverb that has been incorporated into the thematic declenstion: **-ō/ē-t^h- < *-o/e-+H_1(e)t^h(i)* (cf. Lundquist—Yates 2018:2087 [**-o$h_1$ad*]; R. Kim 2012 [**(h_1)éti*]). The accusative plural was clearly built upon the accusative singular by the addition of **-s* to the accusative singular (cf. Burrow 1973:236; Meier-Brügger 2003:163). The extension of the genitive singular in the thematic declension by **-o* and **-yo* was a later development, whose distribution had not yet been completely worked out at the time that Proto-Indo-European began to split up into the individual non-Anatolian daughter languages.

Thus, the following athematic case endings may be reconstructed with a high degree of certainty for the period of development just prior to the separation of the Anatolian branch:

Case	Animate	Inanimate
Singular:		
Nominative	**-s*	
Nominative-accusative		**-Ø*
Vocative	**-Ø*	
Accusative	**-m̥/-m* (or **-n̥/-n*)	
Genitive-ablative	**-es/-as/-s*	**-es/-as/-s*
Dative-Locative	**-ey/-i*	**-ey/-i*
Plural:		
Nominative-vocative	**-es*	
Nominative-accusative		(collective **-(e)H_4*)
Genitive	**-am*	**-am*

The following thematic case endings may be reconstructed for the same period:

Case	Animate	Inanimate
Singular:		
Nominative	**-a-s*	
Nominative-accusative		**-a-m*
Vocative	**-e*	
Accusative	**-a-m* (or **-a-n*)	
Genitive	**-a-s*	**-a-s*
Ablative	**-āt^h* (< **-a-H_1(e)t^h*)	**-āt^h* (< **-a-H_1(e)t^h*)
Dative-Locative	**-āy* (< **-a-ey*)/**-e/a-y*	**-āy* (< **-a-ey*)/ **-e/a-*y

Plural:		
Nominative-vocative	*-*ās* (< *-*a-es*)	
Nominative-accusative		*-*e-*H_4
Genitive	*-*ām* (< *-*a-am*)	*-*ām* (< *-*a-am*)

Note: At this stage of development, apophonic **a* had not yet become apophonic **o* (for details, cf. Chapter 4, §4.8. The Vowels and Diphthongs).

19.7. ACCENTUATION AND ABLAUT IN PROTO-INDO-EUROPEAN

This section is repeated from Chapter 4 (§4.9), "The Reconstruction of the Proto-Indo-European Phonological System".

Disintegrating Indo-European was a *stress-accent* language (for details on accentuation in Proto-Indo-European, cf. Bubenik 1979:90—106; Halle—Kiparsky 1977:209—238; Adrados 1975.I:311—323; Hirt 1895; Meillet 1964:140—143; Szemerényi 1996:73—82; Meier-Brügger 2003:152—158; Fortson 2010:68; Burrow 1973:113—117; Sihler 1995:233—234; Lubotsky 1988; for a good general discussion of stress and *stress-accent* systems, cf. Hyman 1975:204—212, especially p. 207, and for *pitch-accent* systems, pp. 230—233). Correlating with the stress was changing pitch: rising from an unstressed syllable to a stressed syllable and falling from a stressed syllable to an unstressed syllable. Every word, except when used clitically, bore an accent. However, each word had only one accented syllable. (It should be noted here that there was a rule by which the surface accent appeared on the leftmost syllable when more than one inherently accented syllable existed in a word [cf. Lundquist—Yates 2018:2125].) The position of the accent was morphologically conditioned, accentuation being one of the means by which Proto-Indo-European distinguished grammatical relationships. Though originally not restricted to a particular syllable, there was a tendency to level out the paradigm and fix the position of the accent on the same syllable throughout (cf. Adrados 1975.I: 317; Kuryłowicz 1964a:207—208). This tendency began in Disintegrating Indo-European and continued into the individual non-Anatolian daughter languages. Therefore, the Disintegrating Indo-European system is only imperfectly preserved in even the most conservative of the daughter languages, Vedic Sanskrit.

Fortson (2010:119—122) recognizes four distinct types of athematic stems in later (Pre-divisional or "Disintegrating") Proto-Indo-European, determined by the position of the accent as well as the position of the full-grade (or lengthened-grade) vowel (Fortson notes that additional types developed in individual daughter languages) (see also Watkins 1998:61—62; Beekes 1985:1 and 2011:190—191):

1. Acrostatic: fixed accent on the stem throughout the paradigm, but with ablaut changes between the strong and weak cases.
2. Proterokinetic (or proterodynamic): the stem is accented and in full-grade vowel in the strong cases, but both accent and full-grade vowel are shifted to the suffix in the weak cases.

3. Amphikinetic (or holokinetic or amphidynamic): the stem is accented in the strong cases, while the case ending is accented in the weak cases. Typically, the suffix is characterized by a lengthened *o*-grade vowel in the nominative singular and a short *o*-grade vowel in the accusative singular.
4. Hysterokinetic (or hysterodynamic): the suffix is accented in the strong cases, and the case ending in the weak cases.

Szemerényi (1996:162) adds a fifth type:

5. Mesostatic: the accent is on the suffix throughout the paradigm.

An even more elaborate system is set up by Meier-Brügger (2003:205—218).

The rules governing the position of the accent in early Disintegrating Indo-European may be stated rather simply (this was later replaced by the more elaborate system just described):

1. Neuter action nouns were accented on the stem in the so-called "strong" cases but on the ending in the so-called "weak" cases (cf. Burrow 1973:220—226).
2. Common gender agent noun/adjectives were accented on the suffix throughout the paradigm (cf. Burrow 1973:119).
3. Athematic verbs were accented on the stem in the singular but on the ending in the plural (and dual) in the indicative but on the ending throughout the middle (cf. Burrow 1973:303).

The thematic formations require special comment. It seems that thematic agent noun/adjectives were originally accented on the ending in the strong cases and on the stem in the weak cases. This pattern is the exact opposite of what is found in the neuter action nouns. The original form of the nominative singular consisted of the accented thematic vowel alone. It is this ending that is still found in the vocative singular in the daughter languages and in relic forms such as the word for the number 'five', **pʰenkʷʰe* (**peɴqᵘe* in Brugmann's transcription). The nominative singular in **-os* is a later formation and has the same origin as the genitive singular (cf. Szemerényi 1972a:156; Van Wijk 1902).

The system of accentuation found in Disintegrating Indo-European was by no means ancient. The earliest period of Proto-Indo-European that can be reconstructed appears to have been characterized by a strong stress accent (cf. Burrow 1973:108—112; Lehmann 1952:111—112, §15.4, and 1993:131—132; Szemerényi 1996:111—113) — following Lehmann, this period may be called the Phonemic Stress Stage. This accent caused the weakening and/or loss of the vowels of unaccented syllables. There was a contrast between those syllables with stress and those syllables without stress. Stress was used as an internal grammatical morpheme, the stressed syllable being the morphologically distinctive syllable. The phonemicization of a strong stress accent in Early Proto-Indo-European caused a major restructuring of the inherited vowel system and brought about the development of syllabic liquids and nasals (cf. Lehmann 1993:138).

In the latest period of Proto-Indo-European, quantitative ablaut was no longer a productive process. Had there been a strong stress accent at this time, each Proto-Indo-European word could have had only one syllable with full-grade vowel, the vowels of the unstressed syllables having all been eliminated. However, since the majority of reconstructed Proto-Indo-European words have more than one full-grade vowel, the stress accent must have become non-distinctive at some point prior to the latest stage of development.

TO SUMMARIZE: The earliest form of Proto-Indo-European was characterized by a system of vowel gradation in which the normal-grade contrasted with either the reduced-grade or the zero-grade (the choice between the reduced-grade on the one hand or the zero-grade on the other depended upon the relationship of the unstressed syllable to the stressed syllable — functionally, reduced-grade and zero-grade were equivalent). The normal-grade was found in all strongly stressed, morphologically significant syllables, while the reduced-grade or zero-grade were found in all syllables that were morphologically non-distinctive and, therefore, unstressed. The lengthened-grade was a later development and was functionally equivalent to the normal-grade. During the Phonemic Stress Stage of Proto-Indo-European, the basic rule was that no more than one morpheme could have a full-grade vowel in a given polymorphic form, the other morphemes in the syntagmatic sequence being in either zero-grade or reduced-grade.

Proto-Indo-European also made extensive use of inflectional endings as a means to indicate grammatical relationships. The rule that no more than one morpheme could have a full-grade vowel in a given polymorphic form must have caused conflicts between the system of indicating grammatical relationships based upon the positioning of the accent versus that based upon the use of inflectional endings. In other words, it must often have happened that more than one syllable of a word was considered morphologically significant. For example, according to the rules of derivation and inflection, the initial syllable of a word may have received the stress. At the same time, an inflectional ending may have been added, and this ending, in order not to be morphologically ambiguous may also have had a full-grade vowel in addition to that found in the stressed syllable. By the same token, when the shift of accent from, say, the stem to the ending would have produced unpronounceable consonant clusters, the vowel of the stem was retained.

It is likely that the Proto-Indo-European stress was pronounced with special intonations that helped make the accented syllable more discernable. When words with more than one full-grade vowel came into being, stress ceased to be phonemically distinctive. Phonemic pitch then replaced stress as the primary suprasegmental indicator of morphologically distinctive syllables (cf. Burrow 1973:112—113; Lehmann 1952:109—110, §1.53 and 1993:132 and 139), and the accent lost its ability to weaken and/or eliminate the vowels of unaccented syllables — following Lehmann, this period may be called the Phonemic Pitch Stage. The primary contrast was then between morphologically distinctive syllables with full-grade vowel and high pitch and morphologically non-distinctive syllables with full-grade vowel and low pitch.

Concurrent with the morphologically-conditioned development of the system of vowel gradation, another method of indicating grammatical relationships was developing, that being the use of inflectional endings. Some of these markers were inherited by Pre-Proto-Indo-European (for remarks on the prehistoric development of these markers, see Chapter 20 of this book), while others — the majority — arose after Proto-Indo-European had assumed its own independent identity (cf. Blažek 2014). No doubt, the phonemicization of a strong stress accent and the rule that no more than one morpheme could have a full-grade vowel in a given polymorphic form must have wrecked havoc with the original system. Gradually, the vast majority of the earlier markers were replaced by newer forms, and the use of inflectional endings became the primary means of indicating grammatical relationships, with the result that vowel gradation and accentuation became mostly unnecessary and redundant features. It was not long before the earlier system of vowel gradation began to break down as analogical leveling took place. Also, in its later stages, Proto-Indo-European, as well as the individual daughter languages, it may be noted, continued to create new formations that, unlike older formations, were not affected by the causes of vowel gradation. Therefore, the patterns of vowel gradation are only imperfectly preserved in the final stage of the Indo-European parent language and in the various daughter languages.

19.8. PERSONAL PRONOUNS

Szemerényi (1996:216) reconstructs the following first and second person personal pronoun paradigms for Proto-Indo-European (see also Brugmann 1904:407—413; Meillet 1964:332—336; Fortson 2010:141—143; Beekes 2011:232—234; Meier-Brügger 2003:225—227; Watkins 1998:67; Haudry 1979:61—63; Adrados 1975.II:784—813; Schmitt-Brandt 1998:228—231; Adrados—Bernabé—Mendoza 1995—1998.III:27—68; Buck 1933:216—221; Sihler 1995:369—382; Burrow 1973:263—269; Liebert 1957) (Szemerényi's notation is retained):

Case	First Person	Second Person
Singular:		
Nominative	**eg(h)om*, **egō*	**tū*, **tu*
Accusative	**(e)me*, **mē*, **mēm*	**twe*/**te*, **twē*/**tē*, **twēm*/**tēm*
Genitive	**mene*, (encl.) **mei*/**moi*	**tewe*/**tewo*, (encl.) **t(w)ei*/**t(w)oi*
Ablative	**med*	**twed*
Dative	**mei*/**moi*, **mebhi*	**t(w)ei*/**t(w)oi*, **tebhi*
Plural:		
Nominative	**wei*, **n̥smés*	**yūs*, **usmés* (**uswes* ?)
Accusative	**nes*/**nos*, **nēs*/**nōs*, **n̥sme*	**wes*/**wos*, **wēs*/**wōs*, **usme*, **uswes*
Genitive	**nosom*/**nōsom*	**wosom*/**wōsom*

Ablative	**n̥sed*, **n̥smed*	(**used* ?)/**usmed*
Dative	**n̥smei*	**usmei*

A notable feature of the personal pronouns is the use of *suppletion* — in the first person personal pronoun, four distinct stems have been combined into a single paradigm, while three are combined in the case of the second person. At an earlier stage of development, there were also four distinct stems involved in the second person as well. However, the original nominative singular form (**t^{h}i*, see below) was analogically remodeled on the basis of the oblique form (**t^{h}u*) in post-Anatolian Proto-Indo-European. The personal pronouns do not distinguish gender.

The situation is not as straightforward as the above table seems to indicate. The daughter languages actually show a great deal of variation, and this makes it difficult to reconstruct a set of forms for the Indo-European parent language that can account for all of the developments in the daughter languages (cf. Fortson 2010:140). Moreover, bringing the Anatolian data into the picture only adds further complications. Mainly on the basis of the Anatolian data, Sturtevant (1951:103) posited an extremely reduced set of forms for Proto-Indo-Hittite:

Case	First Person	Second Person
Singular:		
Nominative	**'ég*	**tḗ*
Oblique	**mé*, **'ʁmé*	**twé*, **tẃ*
Plural:		
Nominative	**wéys*	?
Oblique	**'nós*, **'ʁns(-smé)*	**'wós*, **'ws(-smé)*

The first person singular personal pronoun has a number of different reflexes in the individual daughter languages — they may be divided into several groups: (1) Greek ἐγώ(ν), Latin *egō*, Venetic *.e.go*; (2) Gothic *ik*, Runic *eka*, Old Icelandic *ek*; (3) Sanskrit *ahám*, Old Persian *adam*, Avestan *azəm*; (4) Armenian *es*, Lithuanian *àš* (Old Lithuanian *eš*), Latvian *es*, Old Prussian *es*, *as*; (5) Old Church Slavic *(j)azъ*; (6) Old Hittite *ú-uk* (later *ú-uk-ga*). The first group points to Proto-Indo-European **ʔek'-oH(m)* (traditional **egō(m)*), the second to **ʔek'-om* (traditional **egom*), the third to **ʔegʰ-om* (traditional **eghom*), the fourth to **ʔekʰ* (traditional **eḱ*), the fifth to **ʔēk'-om* or **ʔēgʰ-om* (traditional **ēgom* or **ēghom*), while the guttural in the sixth group (Hittite) is too phonetically ambiguous to be sure which group it should be assigned to — according to Sturtevant (1951:103, §170b), the *u-* is due to the influence of the oblique forms of the second person personal pronoun (but cf. Kloekhorst 2008b:113—114). For additional forms, cf. Pokorny 1959:291. The variation seems to indicate that this pronoun stem was a late development (cf. Lehmann 1993:157). The common element is **ʔe-* to which one or more than one additional elements have been added. The first element is always a guttural: **ʔe+kʰ-*, **ʔe+k'-*, **ʔe+gʰ-* (cf. Adrados 1975.II:785, II:789, and II:794). In the

fourth group, no additional element has been added after the guttural (Armenian *es*, etc. < **ʔe+kʰ*). In the first group, the element following the guttural is **-oH* (> **-ō*), which could be further extended by **-m* (as in Greek ἐγών — even ἐγώνε in Laconian). In the second group, the element following the guttural is **-om* (Gothic *ik*, etc. < **ʔe-k'-om*), and the same element characterizes the third (Sanskrit *ahám*, etc. < **ʔe-gʰ-om*) and fifth groups as well, though the gutturals are different. Finally, the fifth group points to an earlier long vowel (Old Church Slavic *(j)azъ* < **ʔē-k'-om* or **ʔē-gʰ-om*). The origin of this pronoun is rather transparent — it was a compound deictic stem meaning something like 'this one here' (cf. Lehmann 2002:188—189; Georgiev 1981:58). The elements **-oH* and **-om* are most likely due to the influence of the first person verbal endings (cf. Lehmann 2002:189; Szemerényi 1996:216).

The data from the Anatolian languages demonstrate that the original form of the second person nominative singular was **tʰi*. This form has been preserved intact in Palaic (nom. sg. *ti-i*) and Hieroglyphic Luwian (*ti*), while, in Hittite, it was extended by a guttural, and the initial stop was affricated before the high front vowel (nom. sg. *zi-ik*, *zi-ga*). The oblique cases were based upon **tʰu* (cf. Palaic acc.-dat. sg. *tu-ú*; Hittite acc.-dat. sg. *tu-uk*, *tu-ga*, gen. sg. *tu-(e-)el*; Hieroglyphic Luwian acc. sg. *tu-wa-n*), while the enclitic forms were based upon both **tʰi* (cf. Hittite nom. sg. c. *-ti-iš*, *-te-eš*, acc. sg. c. *-ti-in*) and **tʰa* (cf. Hittite gen. sg. *-ta-aš*).

The second person forms based on **tʰw-* found in the non-Anatolian daughter languages are derived from **tʰu* (cf. Meier-Brügger 2003:226; Szemerényi 1996: 213 and 216).

The first person plural form **n̥s-* and second person plural form **us-* are merely reduced-grade variants of **nos* and **wes* respectively. **n̥s-* was optionally extended by **-me* (> **n̥s-me-*), while **us-* was optionally extended by **-we-* (> **us-we-*) (cf. Meier-Brügger 2003:226, who credits Joshua Katz for the idea). Later, **us-we-* was analogically refashioned to **us-me-* after the first person plural form, though traces of the original patterning survive in the daughter languages (cf. Gothic dat. pl. *izwis* 'to you').

Fortson (2010:142—143) notes that there was also a series of unstressed enclitic object personal pronouns in Proto-Indo-European (see also Meier-Brügger 2003:225—226). Fortson reconstructs the following forms:

Case	First Person	Second Person
Singular:		
Accusative	**me*	**te*
Dative-Genitive	**moi*	**toi*
Plural:		
Oblique (all cases)	**nos*	**u̯os*

It was the enclitic forms that served as the base for the oblique cases of the independent personal pronouns (cf. Lehmann 1993:157). A series of enclitic

possessive pronouns is well represented in Hittite (cf. Meriggi 1980:319—320; Sturtevant 1951:105—106; Kronasser 1956:145—147; Luraghi 1997:22—23; Hoffner—Melchert 2008:137—141; J. Friedrich 1960.I:64—66).

On the basis of the above discussion, the following personal pronoun stems may be reconstructed for the stage of development of the Indo-European parent language immediately prior to the separation of the Anatolian languages from the main speech community (cf. Kloekhorst 2008b:112—116):

Case	First Person	Second Person
Singular:		
Nominative	**ʔe+kʰ-*, **ʔe+k'-*, **ʔe+g-*	**tʰi*
Oblique/Enclitic	**me*	**tʰu*, **tʰa/e*
Plural:		
Nominative	**wey(s)*	**yuH(s)*
Oblique/Enclitic	**nas*	**was*

Notes:
1. As noted above, at this stage of development, apophonic **a* had not yet become apophonic **o*.
2. Likewise, voiced aspirates had not yet developed.

19.9. DEMONSTRATIVE, INTERROGATIVE, AND RELATIVE PRONOUNS

Proto-Indo-European did not possess third person personal pronouns. It did, however, possess various *deictic* and *anaphoric* elements, which served as the basis for demonstratives in later Proto-Indo-European and in the individual daughter languages (cf. Lehmann 2002:190). Brugmann—Delbrück (1897—1916.II/2:1/2: 320—347) list the following stems (see also Adrados 1975.II:813—838; Adrados—Bernabé—Mendoza 1995—1998.III:73—90; Beekes 2011:225—227; Brugmann 1904:399—402; Burrow 1973:269—278; Fortson 2010:144; Lehmann 1993:158—159 and 2002:190; Lundquist—Yates 2018: 2101; Meier-Brügger 2003:228—231; Meillet 1964:325—332; Sihler 1995:384—395; Szemerényi 1996:203—207; Watkins 1998:66; Kapović 2017c:85—88) (Brugmann's notation is retained):

1. **so-*, **to-* (**siu̯o-*, **su̯o-*, **tiu̯o-*, **tu̯o-*), neutrally deictic
2. **k̂o-* (with the particle **k̂e*), **k̂i-*, **k̂(i)u̯o-*, "I"-deictic
3. **i-*, **ī-*: **(i)u̯iā-* and **e-*, **a-*, general deictic
4. the *n*-demonstratives: **no-*, **eno-* (< **e-no-*), **ono-*, **oino-*, **aino-*, distal or yonder-deictic
5. *l*-demonstratives, "that"-deictic (Brugmann 1904:402 reconstructs **ol-* here)

6. *u̯*-demonstratives, distal or yonder-deictic (cf. Avestan *ava-* ‘that’; Old Persian *ava-* ‘that’; Sanskrit gen.-loc. du. *avóṣ* ‘of those two’; Old Church Slavic *ovъ* ‘that, he’ [see also Burrow 1973:274])

According to Beekes (2011:226), there were only two demonstratives in Proto-Indo-European (his notation has been retained):

1. **so*, (f.) **seh₂-*, (n.) **tod* ‘this, that’
2. **h₁e*, (f.) **(h₁)ih₂*, (n.) **h₁id* anaphoric pronoun: ‘that, the (just named)’

Beekes also posits three particles/adverbs, which served as the basis for pronouns in later Proto-Indo-European:

1. **ḱi* ‘here’
2. **h₂en* ‘there’
3. **h₂eu* ‘away, again’

There was also a reflexive pronoun **s(w)e-* ‘(one)self’ (cf. Fortson 2004:130 and 2010:145; Meier-Brügger 2003:226—227; Szemerényi 1996:220—221; Watkins 1998:67). According to Watkins, it was used to mark reference to the subject or topic of a sentence.

The declension of the demonstratives differed somewhat from what is found in nominal stems (cf. Fortson 2010:143—144). The nominative-accusative singular neuter ended in a dental stop (cf. Sanskrit *tá-t*; Latin *(is)tu-d*; Gothic *þat-a*; etc.), while the nominative plural masculine ended in **-i* (cf. Sanskrit *té*; Homeric τοί; Latin *(is)tī*; Old Church Slavic *ti*; etc.). Several of the oblique cases were built on a formant **-sm-*, which was inserted between the stem and the case endings. The stems **so-* and **tʰo-* ‘this, that’ were joined in a suppletive relationship in which **so-* was found in the nominative singular masculine (but without the typical nominative ending **-s* [cf. Sanskrit *sa*, when followed by a word beginning with a consonant; Greek ὁ; Gothic *sa*], though this ending was added later in some daughter languages [cf. Sanskrit masc. sg. *sá-ḥ*]) and feminine (**seH₄* > **sā*), while **tʰo-* served as the basis for the nominative-accusative neuter as well as the remaining cases (cf. Sihler 1995:384—385; Lehmann 1993:158). Fortson (2010: 144) also notes that the genitive singular ending was **-eso* in pronominal stems (cf. Gothic *þis* ‘of the’; Old Church Slavic *česo* ‘of what’; etc.), while a special genitive plural ending **-sōm* can be reconstructed as well. Several of the pronominal endings spread to the nominal declensions, both in the later Indo-European parent language as well as in the older daughter languages.

Hittite possessed the following demonstratives (cf. Luraghi 1997:25—26; Kronasser 1956:147—148; Sturtevant 1951:108—112; Meriggi 1980:322—324; J. Friedrich 1960.I:66—68; Hoffner—Melchert 2008:143—144):

(nom. sg. c.) *ka-a-aš* ‘this’ (“I”-deictic)
(nom. sg. c.) *a-pa-(a-)aš* ‘that’ (“that”-deictic and “you”-deictic)

There were also several rare and/or defective stems in Hittite (this is a sampling; not all attested forms are given) (cf. Hoffner—Melchert 2008:144—146):

(dat. sg.) *e-di*, *i-di*, *e-da-ni* 'that one; he'
(nom. sg.) *a-ši* 'that one, that thing; he, it'
(acc. sg.) *u-ni*, *u-ni-im* 'that one'
(nom.-acc. n.) *e-ni* 'that thing; it'
(dat. sg.) *ši-e-ta-ni* 'he, she, it'
(nom. sg.) *an-ni-iš* 'that yonder'

The following enclitic is also found in Hittite: (nom. c.) *-aš* 'that one; he'.

The stems **so-* and **tʰo-* served as the basis for the connective particles *šu* and *ta* found in Hittite (cf. Sturtevant 1951:108—109). They, along with the stem *na-*, were also combined with enclitic *-aš* as follows (cf. Sturtevant 1951:108—109 and 113; Kronasser 1956:143—144; J. Friedrich 1960.I:63—64; Luraghi 1997:25 and 1998:181):

Case	Enclitic	*ša-* + Enclitic	*ta-* + Enclitic	*na-* + Enclitic
Singular:				
Nom. c.	*-aš*	*ša-aš*	*ta-aš*	*na-aš*
Acc. c.	*-an*	*ša-an*	*ta-an*	*na-an*
Neut.	*-at*		*ta-at*	*na-at*
Dat. (Obl.)	*-še/-ši*			
Plural:				
Nom. c.	*-e*	*še*		
	-at			*na-at*
Acc. c.	*-uš*	*šu-uš*, *šu-ša*	*tu-(u-)uš*	*nu-uš*
	-a		*ta-a*	
Neut.	*-e/-i*			*ne-it-ta*
	-at			*na-at*
Dat. (Obl.)	*-šmaš*			

Luwian had the following demonstratives: (nom. sg. c.) *za-a-aš* 'this' (= Hittite *ka-a-aš*) (nom.-acc. sg. n. *za-a*, nom. pl. c. *zi-(i-)in-zi*, etc.) and (nom. sg. c.) *a-pa-aš* 'that (one); he, she, it; they'. The same stems are found in Hieroglyphic Luwian. Hieroglyphic Luwian also has the stem *ī-* 'this (one)'. Lycian has *ebe-* 'this (one)' and *ẽ* 'him, her; them', while Lydian has (nom. sg. c.) *eśś* 'this' and (nom. sg. c.) *bis* 'he, she'. Palaic has the demonstrative *(-)apa-* 'that (one)'. The common Anatolian demonstrative **aba-* seems to be a uniquely Anatolian development (cf. Puhvel 1984— .1/2:90; Kloekhorst 2008b:191—192).

Most of the anaphoric and deictic elements reconstructed by Brugmann for later Proto-Indo-European (as given above) can be reconstructed for the stage of

development of the Indo-European parent language immediately prior to the separation of the Anatolian languages from the main speech community as well:

1. **sa-*, **t^ha-*
2. **k^ha-/*k^he-*, **k^hi-*
3. **ʔi-*, **ʔe-/*ʔa-*
4. **na-*; **ʔe-na-/*ʔa-na-*

The interrogative stem that Brugmann (1904:402) reconstructs as **q^uo-*, **q^ui-*, **q^uu-* is attested in every branch of the family, including Anatolian. The same stem is used to form indefinite pronouns. Szemerényi (1996:208) reconstructs the Proto-Indo-European paradigm of **k^whi-* 'who?, which?', what?' (Szemerényi writes **k^wi-*, Brugmann **q^ui-*) as follows (see also Watkins 1998:67; Beekes 2011:227—231; Kapović 2017c:88) (Szemerényi's notation has been retained):

	Singular		Plural	
	Masc.-Fem.	Neut.	Masc.-Fem.	Neut.
Nom.	**$k^w$is*	**k^wid*	**k^weyes*	**k^wī*
Acc.	**k^wim*	**k^wid*	**k^wins*	**k^wī*
Gen.	**k^wesyo*		**k^weisōm*	
Dat.	**k^wesm-ei*, *-ōi*		**k^weibh(y)os*	
Loc.	**k^wesmi*		**k^weisu*	
Instr.	**k^wī*			

The Hittite, Palaic, and Luwian paradigms are as follows (cf. Sturtevant 1951:115; Luraghi 1997:26; J. Friedrich 1960.I:68—69; Held—Schmalstieg—Gertz 1988:33; Kronasser 1956:148; Carruba 1970:60; Kimball 1999:266; Hoffner—Melchert 2008:149; Laroche 1959:55; Meriggi 1980:325—327):

	Hittite	Palaic	Luwian
Singular:			
Nom. c.	*ku-iš*	*kuiš*	*ku-(i-)iš*
Acc. c.	*ku-in*	*ku-in*	*ku-i-in*
Nom.-acc. n.	*ku-it*, *ku-wa-at*	*ku-it-*	
Gen.	*ku-e-el*		
Dat.	*ku-e-da-(a-)ni*	(?) *ku-i*	
Abl.	*ku-e-iz(-za)*		
Plural:			
Nom. c.	*ku-(i-)e-eš*, *ku-e*		*ku-in-zi*
Acc. c.	*ku-i-e-eš*, *ku-i-uš*		
Nom.-acc. n.	*ku-e*, *ku-i-e*		*ku-i*
Dat.	*ku-e-da-aš*, *ku-e-ta-aš*		

Thus, we may confidently posit Early Proto-Indo-European interrogative/indefinite stems *$k^{wh}i$- and *$k^{wh}a$- 'who?, which, what?'. Anatolian, Tocharian, Italic, and Germanic also use this stem as a relative (cf. Szemerényi 1996:210). The stem *yo- is used to form relative pronouns, however, in Indo-Iranian, Greek, Phrygian, Gaulish, and Slavic (cf. Adrados—Bernabé—Mendoza 1995—1998.III:96—97; Fortson 2010:144; Kapović 2017c:88—89; Lewis—Pedersen 1961:243; Meier-Brügger 2003:228—229; Meillet 1964:327—328; Szemerényi 1996:210).

Finally, there is some evidence for an interrogative/relative stem *mo- (cf. Adrados—Bernabé—Mendoza 1995—1998.III:94). It only occurs sporadically in relic forms in Celtic, Tocharian, and Anatolian: Cornish (conjunction) *ma*, *may* 'that'; Breton (conjunction) *ma*, *may*, Middle Breton *maz* (from *ma*+*ez*) 'that'; Tocharian B *mäksu* (a) interrogative pronoun: 'which?, who?', (b) interrogative adjective: 'which?, what?', (c) relative pronoun: 'which, who', B *mäkte* (a) interrogative pronoun: 'how?', (b) comparative: 'as', (c) causal: 'because', (d) temporal: 'as, while', (e) final: 'so, in order that', (f) manner: 'how', A *mänt*, *mät* 'how?'; Hittite *maši*- 'how much?, how many?' (cf. Rosenkranz 1978:73).

19.10. NUMERALS

Though there are problems with the reconstruction of a common form for the numeral 'one' (see below), the following cardinal numerals 'one' to 'ten' are traditionally reconstructed for later ("Disintegrating") Proto-Indo-European (for additional information, cf. Adrados 1975.II:871—877; Adrados—Bernabé—Mendoza 1995—1998.III:127—131; Beekes 1995:212—213 and 2011:237—240; Blažek 1999b: 141—324 and 2012; Fortson 2010:145—147; Gamkrelidze—Ivanov 1995.I:740—744; Gvozdanović [ed.] 1992; Justus 1988; Kapović 2017c:89—91; Meillet 1964:409—413; Sihler 1995:404—433; Szemerényi 1960):

	Brugmann (1904:363—365)	Szemerényi (1996:222—224)	Meier-Brügger (2003:233—234)	Fortson (2004:131)
1	*oi-no-s *oi̯uo-	*oinos *oikos	(*Hoi̯-)	*oi-no- *oi-u̯o- *oi-ko-
	*sem-	*sem-	*sem-	*sem-
2	*d(u)u̯ō(u)	*duwō/*dwō	*d(u)u̯o-	*d(u)u̯oh$_1$
3	*trei̯-, *tri-	*treyes	*tréi̯-es	*tréi̯es
4	*q^{u}etu̯or-	*k^{w}etwores	*k^{w}étu̯or-	*k^{w}étu̯ores
5	*peɴq^{u}e	*penk^{w}e	*penk^{w}e	*pénk^{w}e
6	*s(u̯)eks̑	*s(w)eks	*s(u)u̯éḱs	*su̯éks̑
7	*septm̥	*septm̥	*septḿ	*septḿ
8	*oktō(u)	*oktō	*oḱt-	*oktō(u)
9	*neu̯n̥, *enu̯n̥	*newn̥	*h$_1$néu̯n̥	*neu̯n̥
10	*dekm̥	*dekmt/*dekm̥	*déḱm̥	*dekm̥

The numerals in Anatolian are, for the most part, not known inasmuch as they are written ideographically (cf. Luraghi 1997:27). The numeral ‘seven’ occurs in Hittite in the ordinal (dat.) *ši-ip-ta-mi-ya* ‘seventh’ (cf. Sanskrit *saptamá-ḥ* ‘seventh’; Latin *septimus* ‘seventh’) (cf. Sturtevant 1951:30, 44, 60, 63, 77, and 87; Kronasser 1956:152; Benveniste 1962:83). The numeral ‘three’ is also represented in Hittite in (adv.) *te-ri-ya-an-na* ‘for the third time’, and the military title *te-ri-ya-al-la*, *tar-ri-ya-na-al-li* ‘third-in-command, officer of the third rank’ (cf. Kronasser 1956:151; Benveniste 1962:82; Blažek 1999b:186—187), apparently to be read **tri-* ‘three’ (cf. Benveniste 1962:86), while ‘two’ is found in Hittite in the military title *du-ya-na-al-li* ‘second-in-command, officer of the second rank’, the compound *ta-a-i-ú-ga-aš*, *da-a-i-ú-ga-aš*, *ta-a-ú-ga-aš* ‘two years old’ (*da-*/*ta-* ‘two’ + *i-ú-ga-aš* ‘yearling’), *da-a-an*, *ta-a-an* ‘a second time; (before a substantive) second’, and (nom. sg. c.) *da-ma-a-(i-)iš* ‘second, other’ (cf. Benveniste 1962:81; Kronasser 1956:151; Sturtevant 1951:34, 58, 61, 67, and 110), and in Hieroglyphic Luwian *tu-wa/i-zi* ‘two’ (cf. Laroche 1960:206; Meriggi 1962:136; Blažek 1999b:164). All three of these forms agree with what is found in the non-Anatolian Indo-European daughter languages. The forms in the Anatolian languages for the numeral ‘four’, however, differ from those that are found elsewhere: Proto-Anatolian **meyu-* ‘four’ > Hittite (nom. pl.) *mi-e-(ya-)wa-aš*, (acc. pl.) *mi-e-ú-uš*, (gen. pl.) *mi-i-ú-wa[-aš]* ‘four’, Luwian *mauwa-* ‘four’ (instr. pl. *ma-a-u-wa-a-ti*) (cf. Benveniste 1962:81; Laroche 1959:70; Blažek 1999b:201—202; Kloekhorst 2008b:571—572).

Two basic stems may be reconstructed for the numeral ‘one’: **H_1oy-* and **sem-* (cf. Sihler 1995:404—407; Fortson 2010:145). The underlying meaning of the first stem appears to have been ‘single, alone’, while that of the second stem appears to have been ‘together (with)’ (cf. Szemerényi 1996:222; Blažek 1999b:155). The first stem only occurs with various suffixes: (1) **H_1oy-no-* (cf. Latin *ūnus* ‘one’ [Old Latin *oinos*]; Old Irish *óen*, *óin* ‘one’; Gothic *ains* ‘one’; Old English *ān* ‘one’; Old High German *ein* ‘one’; Old Church Slavic *inъ* ‘some(one), other’ — it is also found in Greek οἴνη, οἰνός ‘roll of one [in dice]’); (2) **H_1oy-wo-* (cf. Avestan *aēva-* ‘one’; Old Persian *aiva-* ‘one’ — it is also found in Greek οἶος ‘alone, lone, lonely’ [Cyprian οἰϜος]); (3) **H_1oy-k^{wh}o-* or **H_1oy-k^ho-* (cf. Sanskrit *éka-ḥ* ‘one’; Mitanni [“Proto-Indic”] *aika-* ‘one’). The second stem is found in Greek: Attic (nom. sg. m.) εἷς ‘one’, Doric ἧς ‘one, Cretan ἔνς (< *ἔνς < *ἔμς < **sems*) ‘one’; Attic (f.) μία (< *σμ-ια) ‘one’. It is also found in Armenian *mi* ‘one’. To complicate matters, the various forms of the ordinal found in the daughter languages are based upon yet another Proto-Indo-European stem: **p^her(H)-/*p^hr̥(H)-* ‘first’ (> **p^hr̥H-wo-*, **p^hr̥H-mo-*, **p^hrey-mo-*, **p^hrey-wo-*, **p^hroH-t^ho-*, **p^hroH-mo-*, etc. [for details, cf. Blažek 1999b:141—162; see also Szemerényi 1996:228; Sihler 1995:427—428]). The Hittite word for ‘one’ was **šia-*, cognate with Greek (Homeric) (f.) ἴα ‘one’ (cf. Kloekhorst 2008b:750—751), with traces in Tocharian and Indo-Iranian.

There was a variant form **t’w-i-* (traditional reconstruction **dw-i-*) ‘two’ in Proto-Indo-European that was used in compounds (cf. Gamkrelidze—Ivanov 1995.I:742) and in the adverbial form **t’w-i-s* ‘twice’ (cf. Latin *bis* ‘twice’ [Old Latin *duis*]; Sanskrit *d(u)víḥ* ‘twice’; Avestan *biš* ‘twice’; Greek δίς ‘twice’; Middle High German *zwir* ‘twice’). The regular form for the numeral ‘two’ is traditionally

reconstructed as a dual **duwō*/**dwō* (Szemerényi's reconstruction), though the dual forms may have arisen in the early prehistory of the individual daughter languages themselves (cf. Sihler 1995:408). This view is quite attractive, and I would reconstruct **t'(u)w-o-* as a plural (originally indeclinable) and not as a dual at the Proto-Indo-European level (the plural is still found, for example, in forms such as Greek [nom. pl.] δύο, [nom.-acc. pl.] δυοῖν). Attempts to come up with an etymology within Indo-European itself for this numeral have met with little success (cf. Blažek 1999b:175—179). That the core was **t'(u)w-* (cf. Blažek 1999b:178; Villar 1991a:136—154; Ernout—Meillet 1979:187—188) is shown by the fact that the thematic vowel **-o-* could be added to the core, on the one hand, to yield the form traditionally reconstructed for the independent word for the numeral 'two', while, when used in compounds or to express 'twice', the extension **-i-* could be added to the core instead. Thus, we get **t'(u)w-o- ~ *t'(u)w-i-* 'two'.

There are several forms in Hittite that point to an alternative form for 'two' in Proto-Indo-European — these are: the compound *ta-a-i-ú-ga-aš*, *da-a-i-ú-ga-aš*, *ta-a-ú-ga-aš* 'two years old' (*da-*/*ta-* 'two' + *i-ú-ga-aš* 'yearling'), *da-a-an*, *ta-a-an* 'a second time; (before a substantive) second', and (nom. sg. c.) *da-ma-a-(i-)iš* 'second, other'. These forms point to a Proto-Indo-European **t'e-*/**t'o-* (earlier **t'e-*/**t'a-*) 'two' (cf. Sturtevant 1951:61 [Sturtevant reconstructs Proto-Indo-Hittite **do-* 'two']; Benveniste 1962:78—86 [Benveniste brings in data from non-Anatolian Indo-European daughter languages to support his views]). There is absolutely no way to reconcile **t'e-*/**t'o-* with **t'(u)w-o/i-* phonologically so that they can be convincingly combined in a single reconstruction (Adrados—Bernabé—Mendoza 1995—1998.III:138 note the problems involved and discuss proposed solutions). Consequently, two competing forms must be reconstructed for the numeral 'two' in Proto-Indo-European. If the Proto-Indo-European numeral 'ten' were originally a compound meaning 'two hands', that is, **t'e-* 'two' + **k^hṃ(t^h)-* 'hand', as some have suggested (cf. Szemerényi 1960:69 and 1996:224, fn. 16; Markey 1984:284—285; Justus 1988:533; Gamkrelidze—Ivanov 1995.I: 747; Adrados—Bernabé—Mendoza 1995—1998.III:131; but rejected by Bengtson 1987:258—259 and Blažek 1999b:295—296), it would provide additional evidence for reconstructing two separate forms for the numeral 'two'.

This situation raises the question as to why there should be two alternative forms for the numeral 'two' in Proto-Indo-European. A possible answer is that **t'e-*/**t'o-* may have been the native form (its original meaning may have been 'other, another'), while **t'(u)w-o/i-* may have been a borrowing. Given the geographical location of the Indo-European homeland in the vicinity of the Black Sea near speakers of early Northwest Caucasian languages, these languages might have been a possible source for the **t'(u)w-o/i-* form. Indeed, there is a striking resemblance between Proto-Indo-European **t'(u)w-o/i-* 'two' and similar forms for this numeral in Northwest Caucasian: Proto-Northwest Caucasian **t'q'o-* 'two' > Proto-Circassian **t'ʔʷə* 'two', Proto-Ubykh **t'q'ʷə* (> **t'q'ʷa*) 'twice', Proto-Abkhaz-Abaza **t'ʕʷə* 'two' (cf. Colarusso 1992a:45). Kuipers (1975:19) reconstructs Proto-Circassian **Tq'°(a)* 'two' (> Bžedux *t'°(a)*/*t'(a)w*, *-t'(a)* 'two [twice]'; Kabardian *-t'a* only in *məzamət'a* 'more than once, repeatedly', literally, 'not-once-not-

twice'). Colarusso (1992a:45) derives the Proto-Indo-European form for the numeral 'two' from **t'ʔʷə*, which he claims first became **t'əʔʷ* and then **t'(u)w-o-* (traditional **d(u)w-o-*). Colarusso (1992a) documents many other similarities between Indo-European and Northwest Caucasian. These similarities lead Colarusso to think about possible genetic relationship. I prefer to see the similarities to be due to the fact that the Indo-Europeans occupied territory north of and between the Black and Caspian Seas that was originally inhabited by speakers of early Northwest Caucasian languages (see Chapter 21 for details). We can further speculate that **t'(u)w-o/i-* 'two' eventually replaced the native Proto-Indo-European word for 'two', which survived only in relic forms and in the word for the numeral 'ten' (**t'e-kʰm̥(tʰ)*, literally, 'two hands').

The Proto-Indo-European word for the numeral 'three' is completely straightforward and can be reconstructed **tʰr-ey-*/**tʰr-i-*. Sanskrit (nom.-acc.) *tisráḥ* and related forms in Celtic (cf. Old Irish [f.] *téoir*) are dissimilated from **tʰri-sr-es* (cf. Sihler 1995:410; Burrow 1973:259; Matasović 2009:390).

The word for the numeral 'four' is traditionally reconstructed **kʷetwores* (so Szemerényi; Brugmann reconstructs **qᵘetu̯or-*). The most convincing etymology is that offered by Burrow (1973:259) (see also Beekes 1987a:219):

> 4. This numeral is formed on the basis of a root *kʷet* which seems originally to have meant something like 'angle' (cf. Lat. *triquetrus* 'triangular'), whence 'square' and from that 'four'. In the masc. and neut. (*catvā́ras*, *catvā́ri*, Lat. *quattuor*, etc.) the stem is formed by means of the suffix *-var*, with adjectival accent and vṛddhi in the nominative. In the other cases (acc. *catúras*, etc.) the suffix has the weak form according to the general rule. A neuter noun **cátvar*, or its IE prototype, is presupposed by the thematic extension *catvara-* 'square, crossroads'. Elsewhere the simple *r*-suffix may appear (Gk. Dor. τέτορες, Lat. *quarter*), or the elements of the suffix may be reversed (Av. *čaθru-*).

In accordance with Burrow's views, the form **kʷʰetʰ-wor-* 'four-sided, square' may be reconstructed for later Proto-Indo-European. It was preserved in Sanskrit in the thematic derivative *catvará-m* 'quadrangular place, square, crossroads' (cf. Mayrhofer 1956—1980.I:371). It was this form that served as the basis for the numeral 'four' found in the non-Anatolian daughter languages: (nom. pl.) **kʷʰetʰ-wṓr*. Curiously, the suffix **-wor-* is replaced by **-sor-* in the feminine (cf. Sanskrit *cátasraḥ*). Thus, the root was **kʷʰetʰ-*, to which different suffixes could be added. It is intriguing to speculate that **kʷʰetʰ-wor-* may have replaced an earlier form for 'four', which is preserved in Anatolian. On the other hand, some have suggested that the original form for the numeral 'four' was **H₂okʰtʰo-* and that 'eight' was simply the dual of this stem, whose underlying meaning was 'two groups of four' (cf. Gamkrelidze—Ivanov 1995.I:747; Burrow 1973:260 **oḱtṓ(u)*). This suggestion finds support in Kartvelian (cf. Blažek 1999b:268). The numeral 'four' is reconstructed as **otxo-* in Proto-Kartvelian, and this is generally taken to be a loan from Proto-Indo-European (cf. Fähnrich—Sardshweladse 1995:269; Fähnrich 2007:325—326; Klimov 1964:150—151 and 1998:145—146; Schmidt 1962:128; Gamkrelidze—Ivanov 1995.I:775). I favor this explanation and consider **H₂okʰtʰo-*

to be the original form of the numeral ‘four’ in Proto-Indo-European (perhaps to be derived from an even earlier *H_2ot^h-k^ho- through metathesis, as suggested by the Kartvelian loan *otxo-). It was replaced in Anatolian by *meyu- (cf. Kassian 2009), while, in the non-Anatolian daughter languages, it was replaced by *$k^{w_h}et^h$-wor-. It only survives in the form for the numeral ‘eight’, *$H_2ok^ht^hoH_1(w)$, a dual formation originally meaning ‘two groups of four’. No doubt, this replaced an earlier form for the numeral ‘eight’, which, regrettably, can no longer be recovered.

One final comment may be made here: in Etruscan, there is a numeral *huθ*. Its exact meaning is uncertain — it could be ‘six’, or it could be ‘four’ (cf. Cristofani 1991:77; Blažek 1999b:235; Bonfante—Bonfante 2002:94—95). If it is ‘six’, then the numeral *śa* is ‘four’. On the other hand, if it is ‘four’, then the numeral *śa* is ‘six’. Without going into the whole question here of whether Etruscan and Proto-Indo-European are ultimately genetically related, we can say that *huθ* more closely resembles Proto-Indo-European *$H_2ok^ht^ho$- ‘four’, while *śa* more closely resembles Proto-Indo-European *s(w)eks ‘six’ (Szemerényi’s reconstruction). As noted by Blažek (1999b:211 and 235) and Briquel (1994:329), support for considering the meaning of *huθ* to be ‘four’ comes from the identification of *huθ* in the Pre-Greek name Ὑττηνία for the city Tetrapolis (Τετράπολις, composed of τέτρα- ‘four’ and πόλις ‘city’) in Attica.

The numeral ‘five’ was *$p^henk^{w_h}e$ (Brugmann *$pe\textbf{ɘ}q^{u}e$) in Late Proto-Indo-European. It is usually identified with words for ‘fist’ and ‘finger’: (1) Proto-Indo-European *$p^hn̥k^{w_h}$-st^hi- ‘fist’ > Proto-Germanic *fuŋχstiz > West Germanic *fūχsti- > *fūsti- > Old English *fȳst* ‘fist’; Old Frisian *fest* ‘fist’; Middle Low German *fūst* ‘fist’ (Dutch *vuist*); Old High German *fūst* ‘fist’ (New High German *Faust*) (cf. Mann 1984—1987:968 *$p\underset{\circ}{n}\hat{k}stis$ [*$p\underset{\circ}{n}q\underset{\circ}{u}stis$?] ‘fist’; Onions 1966:358; Kluge—Mitzka 1967:187; Kluge—Seebold 1989:205); Serbian Church Slavic *pęstь* ‘fist’; (2) Proto-Indo-European *$p^henk^{w_h}$-ró- ‘finger’ > Proto-Germanic *fiŋgraz ‘finger’ > Gothic *figgrs* ‘finger’; Old Icelandic *fingr* ‘finger’; Old English *finger* ‘finger’; Old Frisian *finger* ‘finger’; Old Saxon *fingar* ‘finger’; Old High German *fingar* ‘finger’ (New High German *Finger*) (cf. Feist 1939:150; Lehmann 1986:114; De Vries 1977:120; Kluge—Mitzka 1967:198; Kluge—Seebold 1989:215; Orël 2003: 99 *fenɣraz; Kroonen 2013:141 *fingra-). Though not without problems from a phonological point of view, the above comparisons can hardly be questioned. Ultimately, all of these forms may indeed go back to a verbal stem *$p^henk^{w_h}$- ‘to take in hand, to handle’, as suggested by Horowitz (cited by Blažek 1999b:228), though it should be mentioned that this putative verb stem is not attested in any of the daughter languages. Blažek (1999b:229) notes that the meanings ‘fist’, etc. are primary.

Several different reconstructions are possible for the Proto-Indo-European word for the numeral ‘six’: *sek^hs, *$swek^hs$, *k^hsek^hs, *k^hswek^hs, *wek^hs (for details, cf. Blažek 1999b:234—242; see also Sihler 1995:413). This numeral was also borrowed by Kartvelian: Proto-Kartvelian *ekšw- ‘six’ (cf. Klimov 1998:48 *eks_1w-; Fähnrich—Sardshweladse 1995:125—126 *eks_1w-; Fähnrich 2007:151—152; Schmidt 1962:107 *ekšw-/*ekšu; Gamkrelidze—Ivanov 1995.I:775 *ekŝw-). Sihler (1995:413) takes *wek^hs (he writes *weḱs) to be the original form and considers the initial *s- to be a secondary development (imported from the numeral

'seven') (Szemerényi 1996:222 and Beekes 2011:240 express the same view; but cf. Viredaz 1997). Thus, following Sihler, the earliest form of the Proto-Indo-European numeral 'six' may be reconstructed as **wek^{h}s*. As Sihler notes, when **s-* was merely added to **wek^{h}s*, the result was **swek^{h}s*, but when it replaced the initial consonant, the result was **sek^{h}s*. The Iranian forms pointing to original **k^{h}swek^{h}s* (cf. Avestan *xšvaš* 'six') appear to be due to developments specific to Iranian and should not be projected back into Proto-Indo-European (cf. Sihler 1995:413).

The Proto-Indo-European word for the numeral 'seven', **sep^{h}t^{h}m̥* (Brugmann **septm̥*), is sometimes considered to be a loan from Semitic (cf. Blažek 1999b: 256—257; Gamkrelidze—Ivanov 1995.I:747). That this numeral is ancient in Indo-European is clear from the fact that it is found in Hittite.

We have already discussed the numerals 'eight' and 'ten' above. For 'nine', Proto-Indo-European most likely had **newn̥* (cf. Szemerényi 1996:223). Other possible reconstructions are **newm̥* and **H$_1$newn̥/m̥* (cf. Brugmann 1904:365 **neu̯n̥*, **enu̯n̥*; Meier-Brügger 2003:234 **h$_1$neu̯n̥*; Watkins 1998:67 **h$_1$néwn̥*; Haudry 1979:68 **néwm̥/n̥*; Gamkrelidze—Ivanov 1995.I:744 **neu(e)n*; Burrow 1973:260; Sihler 1995:415 **H$_1$néwn̥*; Buck 1933:230 [Buck takes Greek ἐννέα to be "a blend of *ἐνϝα and *νεϝα"]; Rix 1992:172 **h$_1$néu̯n̥*; Blažek 1999b:283).

The Proto-Indo-European word for the numeral 'hundred' is traditionally reconstructed as **(d)km̥tóm* — it is usually considered to be a derivative of **dekm̥(t)* 'ten' and meant something like 'ten tens' (cf. Beekes 2011:240; Gamkrelidze—Ivanov 1995.I:744; Meier-Brügger 2003:235; Szemerényi 1996:226; Watkins 1998:67).

Though there was probably no common Proto-Indo-European word for 'thousand', the form **g^{h}eslo-* served as the basis for the Indo-Iranian, Greek, and Latin terms (cf. Szemerényi 1996:227; Beekes 2011:241; Meier-Brügger 2003:235; Meillet 1964:414; Brugmann 1904:368).

Lacking Anatolian corroboration for several numerals (cf. Hoffner—Melchert 2008:153), it is difficult to reconstruct the earliest Proto-Indo-European forms for the numerals 'one' to 'ten' with complete confidence. Consequently, the following reconstructions must be considered provisional:

1 **H$_1$oy-* (with original, non-apophonic *-o-*), **sem-*, **p^{h}er(H)-/*p^{h}r̥(H)-*, **sya-*
2 **t'e/a-*; (later also) **t'(u)w-a-*, **t'(u)w-i-*
3 **t^{h}r-ey-/*t^{h}r-i-*
4 **H$_2$ok^h-t^{h}a-* (< **H$_2$ot^h-k^{h}a-* ?) (perhaps with original, non-apophonic *-o-* in the first syllable, as indicated by Proto-Kartvelian **otxo-* 'four', which is considered to have been borrowed from Proto-Indo-European [see above])
5 **p^{h}enk^{wh}e* (perhaps for earlier **p^{h}n̥k^{wh}é*)
6 **wek^{h}s*
7 **sep^{h}t^{h}m̥*
8 ?
9 **newn̥*
10 **t'e-k^{h}m̥(t^h)*

19.11. PRELIMINARY REMARKS ON PROTO-INDO-EUROPEAN VERB MORPHOLOGY

Verb morphology in Proto-Indo-European was considerably more complicated than noun morphology (cf. Meier-Brügger 2003:163). The system reconstructed by the Neogrammarians was modeled mainly on what is found in Greek and Indo-Iranian (especially Sanskrit) (cf. Lehmann 1993:161; Meier-Brügger 2003:163). However, most Indo-Europeanists now consider the complicated systems found in these branches to be due, at least in part, to secondary developments (cf. Schmalstieg 1980:88), and they would, consequently, reconstruct a less complex system for the Indo-European parent language than what was reconstructed by the Neogrammarians, though there is still considerable disagreement on important details. Anatolian verb morphology has played an enormous role in changing the views of the scholarly community. Though based on common elements, the Anatolian system differs sufficiently from what is found in the non-Anatolian daughter languages that it cannot possibly be derived from the system of verb morphology reconstructed for Proto-Indo-European by the Neogrammarians (cf. Lehmann 1993:164). Finally, recent advances in linguistic theory as well as insights gained from the study of typological data have also been instrumental in changing opinions.

In addition to the standard comparative grammars, there exists a large body of literature devoted exclusively to the study of aspects of Proto-Indo-European verb morphology — some of these studies are: Adrados 1963, 1974, 1975, and 1981a; Bammesberger 1982; Benveniste 1949; Bomhard 1988c; Cowgill 1975 and 1979; Disterheft 1980; Drinka 1975; Gonda 1956; Hahn 1953; Hoffmann 1967; Ivanov 1981; Jasanoff 1978b, 1979, and 2003; Kerns—Schwartz 1937, 1946, 1972, and 1981; Kortlandt 1983b; Lehmann 1994 and 2004; Narten 1964; Niepokuj 1997; Puhvel 1960; Shields 1992; Szemerényi 1987a; Watkins 1962 and 1969.

19.12. GENERAL CHARACTERISTICS OF PROTO-INDO-EUROPEAN VERB MORPHOLOGY AND DEFINITION OF TERMS

As with nominal stems, an important distinction was made in Proto-Indo-European between *thematic* and *athematic* verbal stems (cf. Watkins 1998:56; Szemerényi 1996:232; Beekes 2011:252; Meier-Brügger 2003:164—165; Fortson 2010:84 and 95—96). Personal endings were added directly to the verbal stem in the case of athematic stems, while the thematic vowel **-o/e-* was inserted between the stem and the personal endings in the case of thematic stems: cf. athematic (3rd sg. present active) **g^{w}^{h}én-t^{h}i* ‘he/she slays’ vs. thematic (3rd sg. present active) **b^{h}ér-e-t^{h}i* ‘he/she bears, carries’. Kerns—Schwartz (1972:2—3) consider the thematic stems to be later formations, and this seems to be the common opinion (cf. Fortson 2010:95—96; Meillet 1931; Ringe 1998b:34—39), though Schmalstieg (1980:90—91) argues that the thematic stems were ancient.

Proto-Indo-European distinguished three *persons*:

1. The person(s) speaking;
2. The person(s) spoken to, that is, the person(s) being addressed;
3. The person(s) or thing(s) spoken about, that is, everyone or everything else.

The persons were distinguished by a special set of *personal endings*. These personal endings will be discussed in detail below.

Again, as with the noun, there were three *numbers* in the verb, at least for the latest period of the Indo-European parent language just prior to the emergence of the non-Anatolian daughter languages: *singular*, *dual*, and *plural* (cf. Meillet 1964:243—244). All three numbers were preserved in the verbal systems of Sanskrit, Avestan, Gothic, Older Runic, Old Church Slavic, Lithuanian, and certain Ancient Greek dialects (cf. Meillet 1964:243—244). As is to be expected, there was no separate dual in the Anatolian languages (cf. Kerns—Schwartz 1972:5).

Tense marks the *time* at which an action takes place. The following *tenses* are assumed to have existed in later Proto-Indo-European (cf. Fortson 2010:88—89; Szemerényi 1996:231; Beekes 2011:251; Baldi 1987:57—58 [Baldi does not posit an imperfect for Proto-Indo-European]):

1. Present: occurring in the present;
2. Imperfect: occurring at some unspecified point in the past;
3. Aorist: occurring once and completed in the past;
4. Perfect (now more commonly called *stative*): referring to a state in present time (at a later date, the perfect developed into a *resultative*, and then into a simple *preterite* in the individual daughter languages).

There may have also been:

5. Pluperfect: referring to a state existing in the past;
6. Future: referring to an action or an event that will occur at some unspecified point in the future (the reconstruction of a future is rejected by Beekes 2011: 252).

Later Proto-Indo-European had four *moods* (cf. Fortson 2004:83 and 2010:90; Meillet 1964:223—226; Szemerényi 1996:231), which were used to express the speaker's attitude toward the action:

1. Indicative: used to express something that the speaker believes is true;
2. Subjunctive: used to express uncertainty, doubt, or vagueness on the part of the speaker;
3. Optative: used by the speaker to express wishes or hopes;
4. Imperative: used by the speaker to express commands.

Beekes (2011:251) also adds an *injunctive mood* to the above. However, Szemerényi (1996:263—264) maintains that the injunctive was not an independent modal category in Proto-Indo-European.

There was also the category of *voice*, which was used to express the role that the subject played in the action. There were two voices in Proto-Indo-European (cf. Fortson 2010:89—90; Szemerényi 1996:231; Haudry 1979:71; Baldi 1987:56):

1. Active: the subject is performing the action but is not being acted upon;
2. Middle (also called "mediopassive"): the subject is being acted upon: either the subject is performing the action on or for himself/herself, or the subject is the recipient but not the agent of the action.

The *agent* is the entity responsible for a particular action or the entity perceived to be the cause of an action, while the *patient* is the recipient, goal, or beneficiary of a particular action.

While *tense* marks the *time* at which an action takes place, *aspect* refers to the *duration* or *type* of a temporal activity. While tense and aspect are closely related, they must ultimately be carefully distinguished. Aspect can indicate an action that is done once at a single point in time (*punctual aspect*), an action that lasts for a certain length of time (*durative aspect*), an action that is repeated over and over again (*iterative* or *frequentative aspect*), an action that is regularly or habitually performed by someone or something (*habitual aspect*), an action or event that is about to begin (*inceptive aspect*, *inchoative aspect*, or *ingressive aspect*), an action or event that is in progress (*progressive aspect*), etc. A distinction can also be made between *perfective aspect* and *imperfective aspect* — the *perfective aspect* lacks a reference to a particular point of time, while the *imperfective aspect* is a broad term that indicates the way in which the internal time structure of the action is viewed. The imperfective includes more specialized aspects such as *habitual*, *progressive*, and *iterative*. Though the full extent to which Proto-Indo-European employed aspect is not entirely clear, the *imperfect tense* also had *imperfective aspect*, while the *aorist tense* had *perfective aspect* (cf. Fortson 2010:90—91; Haudry 1979:76 [regarding the aorist only]). According to Meier-Brügger (2003:165), the *aorist stem* indicated *perfective aspect*, the *present stem* indicated *imperfective aspect*, and the *perfect stem* indicated a kind of *resultative aspect*. For details about tense and aspect in general, cf. Comrie 1976 and 1985; Crystal 1980 and 2003; Trask 1993.

Several other terms should be defined as well: a *finite* verbal form denotes an action, an event, or a state and is marked for tense, number, mood, aspect, etc. A *finite* verbal form can occur on its own in an independent clause. A *non-finite* verbal form is not marked for tense, number, mood, aspect, etc. and can only occur on its own in a dependent clause. Non-finite forms include *participles*, *infinitives*, *verbal nouns*, and *verbal adjectives* (cf. Kerns—Schwartz 1972:1). A *transitive* verb takes a *direct object*, while an *intransitive* verb does not. A *direct object* denotes the goal, beneficiary, or recipient of the action of a transitive verb (the *patient*). An *indirect object* denotes the person or thing that is indirectly affected by the action of the verb. Additional terms will be defined as they occur. As an aside, it may be noted that research begun in 1980 by Paul J. Hopper and Sandra Thompson and since continued by many others (Comrie, Givón, Kemmer, Langacker, Rice, Slobin, etc.) has greatly enhanced our understanding of transitivity.

We may close by mentioning the special position occupied by *-*n*- in verbal derivation in Proto-Indo-European. Unlike other derivational elements, *-*n*- was inserted as an infix into type II verbal stems (**CCéC*-) according to the following scheme: **CC-n-éC*- (cf. Benveniste 1935:159—163 [note especially the table on p. 161]; see also Szemerényi 1996:270—271; Sihler 1995:498—499; Fortson 2010:97; Lehmann 1993:170—171), but only when the verbal stems ended in obstruents or laryngeals (cf. Lehmann 2004:118; Milizia 2004). Lehmann further notes that this infix was used in active forms but not in forms that indicated a state. According to Gray (1939:137), the nasal infix denotes "the point from or to which action proceeds, so that [it] characterize[s] terminative verbs (Sanskrit *yu-ñ-ja-ti*, Latin *iu-n-g-it* 'starts to put on a yoke and carries the process through'…)" (see also Meiser 1993).

19.13. PERSONAL ENDINGS

As noted by Szemerényi (1996:233), there were different sets of personal endings in Proto-Indo-European, each of which had a specialized function. One set of personal endings was used with the active voice and another with the middle voice and still different sets were used with the present and past within each of these voices. Different sets were also used with the perfect and with the imperative. Each person had its own special ending, as did each number. Thus, the distinctions marked by the personal endings may be summarized as follows (cf. Watkins 1998:59):

1. Person: three (1st person, 2nd person, 3rd person)
2. Number: three (singular, dual, plural)
3. Voice: two (active, middle)
4. Tense: two (present, past)
5. Perfect
6. Imperative

There was also a difference between *primary* and *secondary* endings and between *thematic* and *athematic* endings. The terms "primary" and "secondary" are misnomers — the active primary endings arose from the secondary endings through the addition of a particle *-*i* indicating 'here and now' to the 1st, 2nd, and 3rd persons singular and the 3rd person plural (cf. Watkins 1998:59; Kerns—Schwartz 1972:4; Szemerényi 1996:327; Fortson 2004:85 and 2010:93; Lehmann 1993:173; Sihler 1995:455; Burrow 1973:314). Intraparadigmatic ablaut and accent variations also played a role in determining the form of the personal endings.

We can now look more closely at each set of personal endings, beginning with the active endings of the present/aorist (cf. Meier-Brügger 2003:178; Szemerényi 1996:233—238; Watkins 1969:22—68 and 1998:60—61; Meillet 1964:227—232; Brugmann 1904:589—594; Burrow 1973:306—311; Gamkrelidze—Ivanov 1995.I: 283—286; Beekes 2011:258—261; Adrados 1975.II:601—605; Sihler 1995:454; Fortson 2010:92—93; Clackson 2007:123—125; Baldi 1987:58; Rix 1992:240):

	Secondary endings		Primary endings	
Person	Athematic	Thematic	Athematic	Thematic
1st sg.	*-*m*	*-*o-m*	*-*m-i*	*-*o-H_2*
2nd sg.	*-*s*	*-*e-s*	*-*s-i*	*-*e-s-i*
3rd sg.	*-*t^h*	*-*e-t^h*	*-*t^h-i*	*-*e-t^h-i*
1st dual	*-*we(H_1)*	*-*we-*	*-*we(s)*/*-*wo(s)*	
2nd dual	*-*t^hom*	*-*t^h(H)o*	*-*t^h(H)es*	
3rd dual	*-*t^heH_2m*		*-*t^hes*	
1st pl.	*-*me*	*-*o-me*	*-*me(s)*/*-*mo(s)*	*-*o-me-*
2nd pl.	*-*t^he*	*-*e-t^he*	*-*t^he*	*-*e-t^he-*
3rd pl.	*-*$n̥t^h$*/*-*ent^h*	*-*o-nt^h*	*-*$n̥t^h$-i*/*-*ent^h-i*	*-*o-nt^h-i*

Notes:

1. The 1st singular and plural may have had alternative endings in */w/ besides */m/, as indicated by the Luwian 1st singular present indicative ending *-wi* and the Hittite 1st plural present indicative primary endings *-weni*/*-wani*. The */w/ is also preserved in the 1st singular preterite ending in Tocharian: A *-wā*, B *-wa*.
2. The dual endings given in the above table are extremely controversial.
3. On the basis of the Hittite and Greek evidence, it is possible that the athematic primary endings for the 1st person plural may have had the alternative forms *-*men*/*-*mon* in the Indo-European parent language (cf. Szemerényi 1996:235; Beekes 2011:259). It is clear that the basic ending was *-*me*-/*-*mo*- to which the plural markers *-*s* or *-*n* could be optionally added. The individual daughter languages chose one or the other of these variants. In the case of Indo-Iranian, the resulting *-*mes*/*-*mos* was further extended by *-*i*, yielding, for example, the Vedic 1st plural primary ending *-masi*, Avestan *-mahi* (cf. Burrow 1973: 308—309; Beekes 1988:154), while the same thing happened in Hittite, but with the *-*men*/*-*mon* endings instead.

The primary endings were used in the present, while the secondary endings were used in the aorist (cf. Szemerényi 1996:233; Meier-Brügger 2003:166). In addition, the secondary endings were used in the optative and in the imperfect (cf. Meier-Brügger 2003:166). Finally, both primary and secondary endings could be used in the subjunctive (cf. Meier-Brügger 2003:166). Except for the fact that they were added after the thematic vowel in thematic stems instead of directly to the undifferentiated verbal stem as in athematic stems, the endings were identical in thematic and athematic stems apart from the first person singular thematic primary ending, which was *-*o-H_2* (cf. Szemerényi 1996:233 and 236—237; Meier-Brügger 2003:179). Thematic and athematic stems were differentiated, however, by the fact that there was an ablaut variation along with a corresponding shift in the placement of the accent between the singular and plural in active athematic stems, while the

thematic formations do not exhibit such variations between singular and plural forms (cf. Meier-Brügger 2003:168).

The following reconstructed Proto-Indo-European paradigms of *H_1es- ‘to be’ and *b^her- ‘to bear, to carry’ illustrate the typical patterning of the active/aorist system (only the singular and plural forms are given) (cf. Szemerényi 1996:314 and 316; Fortson 2004:87, 89, and 2010:96, 98; Sihler 1995:548; Watkins 1969:25 and 40; Buck 1933:242—243; Clackson 2007:124—127; Beekes 2011:258—261):

	Athematic		Thematic	
	Primary	Secondary	Primary	Secondary
Singular				
1	*H_1és-mi	*H_1és-m̥	*b^hér-o-H_2	*b^hér-o-m
2	*H_1és-si	*H_1és-s	*b^hér-e-si	*b^hér-e-s
3	*H_1és-t^hi	*H_1és-t^h	*b^hér-e-t^hi	*b^hér-e-t^h
Plural				
1	*H_1s-mé(s)	*H_1s-mé	*b^hér-o-me(s)	*b^hér-o-me
2	*H_1s-t^hé	*H_1s-t^hé	*b^hér-e-t^he	*b^hér-e-t^he
3	*H_1s-ént^{h}i	*H_1s-ént^h	*b^hér-o-nt^{h}i	*b^hér-o-nt^h

Notes:
1. The athematic and thematic secondary forms are for the imperfect.
2. The imperfect is characterized by the so-called “augment” in Sanskrit and Greek (see below).
3. There was a change of accent and ablaut in the athematic stems — in the singular, the stem had full-grade vowel and was accented, while, in the plural, the stem had zero-grade vowel, and the accent was shifted to the ending.

In Indo-Iranian and Greek, there is a prefix *H_1e-, usually termed the “augment”, which is added to imperfect and aorist stems. The same prefix is found in Armenian, but it is only added to the aorist. There is also a trace of the augment in Phrygian (cf. Diakonoff—Neroznak 1985:22—23; Brixhe 1994:173—174 and 2004:785; Fortson 2010:462: cf. Old Phrygian *e-daes*/ε-δαες ‘[he/she] put, placed’ [= Latin *fēcit*]). The use of the augment was a later development specific to these branches (cf. Lehmann 1993:165, 180—181, 244 and 2002:32—33; Meier-Brügger 2003:182; Sihler 1995:484—485; Meillet 1964:242—243) and, accordingly, is not to be reconstructed for Proto-Indo-European. According to Beekes (1995:226 and 2011:251—252), Meier-Brügger (2003:182), and Lundquist—Yates (2018:2141), the augment developed from a Proto-Indo-European adverb *H_1e- meaning ‘at that time’.

The next set of personal endings to be examined are the middle endings of the present/aorist system (only the singular and plural forms are reconstructed in the following table) (cf. Adams 1988:59; Fortson 2004:86—87 and 2010:94—95; Lundquist—Yates 2018:2154; Sihler 1995:471; Watkins 1998:61, table 2.8):

	Secondary endings		Primary endings	
Person	Athematic	Thematic	Athematic	Thematic
1st sg.	*-H_2e	*-o-H_2e	*-H_2e-r	*-o-H_2e-r
2nd sg.	*-t^hH_2e	*-e-t^hH_2e	*-t^hH_2e-r	*-e-t^hH_2e-r
3rd sg.	*-t^ho	*-o	*-t^ho-r	*-o-r
1st pl.	*-$med^hH_{\circ}$	*-o-$med^hH_{\circ}$	*-$med^hH_{\circ}$	*-o-$med^hH_{\circ}$
2nd pl.	*-d^hwe	*-e-d^hwe	*-d^hwe	*-e-d^hwe
3rd pl.	*-nt^ho, *-ro	*-o-nt^ho, *-o-ro	*-nt^ho-r, *-ro-r	*-o-nt^ho-r, *-o-ro-r

Recently, there has been a shift of opinion regarding the reconstruction of the middle endings. Earlier views based the reconstruction of these endings mainly on the forms found in Indo-Iranian and Greek, and it is these older reconstructions that are given, for example, in Brugmann (1904:594—596), Meillet (1964:232—234), Szemerényi (1996:239), Meier-Brügger (2003:179—180), Rix (1992:240 and 246—249), and Buck (1933:248, §342), among others. However, the primary middle personal endings in *-*r* found in Anatolian, Italic, Celtic, Tocharian, and Phrygian are now thought to represent the original patterning, while the primary middle personal endings in *-*i* found in Indo-Iranian, Greek, Germanic, and Albanian are taken to be innovations (cf. Fortson 2010:94). Gamkrelidze—Ivanov (1995.I:286—288), however, suggest that both types of middle personal endings go back to Proto-Indo-European and that there has been contamination between the two types in the individual daughter languages. Beekes (2011:269 and 282), on the other hand, rejects the reconstructions based upon the Indo-Iranian and Greek models and also assumes that the primary middle endings in *-*i* are innovations and do not represent the situation in the Indo-European parent language. However, he views the endings in *-*r* as innovations as well and claims, consequently, that there was no difference here between primary and secondary endings in the middle. Beekes (2011:282) summarizes his views in a table (see also the sample paradigm on p. 285). My own thinking is that there was only one set of middle personal endings in Proto-Indo-European — not two as proposed by Gamkrelidze—Ivanov — and that Anatolian, Italic, Celtic, Tocharian, and Phrygian reflect the original patterning (cf. Sihler 1995:473). The middle personal endings were related to the perfect (= stative) personal endings (cf. Kuryłowicz 1964:58 and 61; Watkins 1998:60), as is clear from the forms listed in the above table when compared with the perfect personal endings, which are given below. I further support the view that the middle personal endings found in Indo-Iranian, Greek, Germanic, and Albanian are innovations. The middle personal endings found in these branches may be viewed as having been remodeled after the active endings (cf. Sihler 1995:472; Fortson 2010:93). They have, however, retained traces of the older endings (cf. Burrow 1973:315). Even in the branches that have preserved the middle personal endings in *-*r*, there has been some contamination by the active personal endings as well as other innovations specific to each branch (for an excellent discussion of the development of

the middle personal endings in the various Indo-European daughter languages, cf. Sihler 1995:474—480). Contamination by the active personal endings is most certainly what has happened, for example, in Hittite in the 3rd plural present endings of the *ḫi*-conjugation, which are based upon **-nt^{h}i* (> Hittite *-anzi*, with *-z-* from earlier **-t^h-* before *-i*) instead of the expected **-nt^{h}o-r* or **-ro-r* (cf. Hittite 3rd pl. pres. *ak-kán-zi* 'they die' [but pret. *a-ki-ir*, *a-kir*, *e-ki-ir*, *e-kir*]; 3rd pl. pres. *a-ra-an-zi* 'they arrive' [but pret. *e-ri-(e-)ir*, *i-e-ri-ir*]; 3rd pl. pres. *a-še-ša-an-zi*, *a-ši-ša-an-zi* 'they set up, they found' [but pret. *a-še-(e-)še-ir*, *a-še-šir*]; 3rd pl. pres. *ḫa-aš-ša-an-zi*, *ḫé-eš-ša-an-zi* 'they open' [but pret. *ḫi-e-še-ir*]; *ka-ri-pa-an-zi*, *ka-ra-pa-an-zi* 'they devour' [but pret. *ka-ri-e-pí-ir*]; *še-ik-kán-zi* 'they know' [but pret. *še-ik-ki-ir*] [the preceding examples are taken from Sturtevant 1951:160—171; for additional examples, cf. J. Friedrich 1960.I:98—106; Kronasser 1966.1:511—569]).

The following reconstructed Proto-Indo-European paradigm of **b^{h}er-* 'to bear, to carry' illustrates the typical patterning of the middle system (only the singular and plural thematic forms are given) (cf. Fortson 2004:86—87 and 2010:94—95):

	Primary (Non-past)	Secondary (Past)
Singular		
1	**b^{h}ér-o-H$_2$e-r*	**b^{h}ér-o-H$_2$e*
2	**b^{h}ér-e-t^{h}H$_2$e-r*	**b^{h}ér-e-t^{h}H$_2$e*
3	**b^{h}ér-o-r*	**b^{h}ér-o*
Plural		
1	**b^{h}ér-o-med^{h}H̥*	**b^{h}ér-o-med^{h}H̥*
2	**b^{h}ér-e-d^{h}we*	**b^{h}ér-e-d^{h}we*
3	**b^{h}ér-o-ro-r*	**b^{h}ér-o-ro*

Now, let us take a look at the perfect (= stative) endings (in comparison with the middle endings, repeated here from the above table [cf. Fortson 2004:93 and 2010: 103]) (only the singular and plural forms are given) (note also Jasanoff 2003:55):

		Middle endings			
		Secondary endings		Primary endings	
Person	Perfect	Athematic	Thematic	Athematic	Thematic
1st sg.	**-H$_2$e*	**-H$_2$e*	**-o-H$_2$e*	**-H$_2$e-r*	**-o-H$_2$e-r*
2nd sg.	**-t^{h}H$_2$e*	**-t^{h}H$_2$e*	**-e-t^{h}H$_2$e*	**-t^{h}H$_2$e-r*	**-e-t^{h}H$_2$e-r*
3rd sg.	**-e*	**-t^{h}o*	**-o*	**-t^{h}o-r*	**-o-r*
1st pl.	**-me-*	**-med^{h}H̥*	**-o-med^{h}H̥*	**-med^{h}H̥*	**-o-med^{h}H̥*
2nd pl.	**-e*	**-d^{h}we*	**-e-d^{h}we*	**-d^{h}we*	**-e-d^{h}we*
3rd pl.	**-ēr*, **-r̥s*	**-nt^{h}o*, **-ro*	**-o-nt^{h}o*, **-o-ro*	**-nt^{h}o-r*, **-ro-r*	**-o-nt^{h}o-r*, **-o-ro-r*

The close resemblance between the two sets of personal endings is obvious, at least in the singular (cf. Burrow 1973:317). The perfect personal endings are most certainly the oldest, and the middle personal endings are later formations derived from them (cf. Burrow 1973:317; Kurzová 1993:120—121 and 157—171).

The perfect of traditional grammar is now commonly interpreted as stative. It referred to a state in present time (cf. Watkins 1998:57; Jasanoff 1979:79) and was restricted to verbs that were semantically appropriate (cf. Lehmann 2002:77 and 78—80; Sihler 1995:564). Later, it developed into a resultative and, from that, into a preterite in the individual Indo-European daughter languages (cf. Watkins 1998: 57; Lundquist—Yates 2018:2167; Kümmel 2000 [for Indo-Iranian]; Chantraine 1926 [for Greek]). The perfect was characterized by reduplication (cf. Fortson 2004:93—95 and 2010:103—105), by a special set of personal endings, and by a change of accent and ablaut between the singular and plural. There was no distinction between "primary" and "secondary" personal endings in the perfect.

The following reconstructed Proto-Indo-European paradigm of **me-mon-* 'to remember' illustrates the typical patterning of the perfect system (only the singular and plural forms are given) (cf. Fortson 2004:94 and 2010:104) (Jasanoff 2003:42 reconstructs a different set of plural forms):

	Singular	Plural
1	**me-món-H_2e*	**me-mn̥-mé*
2	**me-món-t^hH_2e*	**me-mn-é*
3	**me-món-e*	**me-mn-ḗr*

Reduplication, however, was missing in the case of the Proto-Indo-European perfect stem **woyt'-* (traditional **u̯oi̯d-*) 'to know' (from **weyt'-* 'to see' [traditional **u̯ei̯d-*]) (only the singular and plural forms are given) (cf. Beekes 2011:265; Buck 1933:286; Fortson 2004:94 and 2010:104; Rix 1992:255; Szemerényi 1996:243—244; Sihler 1995:570):

	Proto-Indo-European	Sanskrit	Homeric Greek	Gothic	Latin
Singular					
1	**wóyt'-H_2e*	*véda*	(Ϝ)οἶδα	*wait*	*vīdī*
2	**wóyt'-t^hH_2e*	*véttha*	(Ϝ)οἶσθα	*waist*	*vīdistī*
3	**wóyt'-e*	*véda*	(Ϝ)οἶδε	*wait*	*vīdit*
Plural					
1	**wit'-mé*	*vidmá*	(Ϝ)ἴδμεν	*witum*	*vīdimus*
2	**wit'-é*	*vidá*	(Ϝ)ἴστε	*wituþ*	*vīdistis*
3	**wit'-ḗr*	*vidúr*	(Ϝ)ἴσ(σ)ᾱσι	*witun*	*vīdēre*, *-ĕrunt*

Notes:
1. According to Sihler (1995:571), the Greek 2nd person singular ending -σθα cannot be directly derived from *-t^hH_2e. Buck (1933:144), however, considers it to be the regular outcome of the combination δ + θ.
2. The Greek 3rd plural ending has been imported from the active/aorist system (cf. Sihler 1995:572). According to Buck (1933:286), (Ϝ)ἴσ(σ)ᾱσι is from *Ϝιδ-σαντι.
3. The Sanskrit 3rd plural ending *-úr* is most likely from earlier *-*ŕš* (cf. Burrow 1973:310; Brugmann 1904:597).
4. The Latin forms have been extensively remodeled. However, the 3rd plural ending is archaic. According to Sihler (1995:588), the oldest form of the 3rd plural ending in Latin was *-ēre* (< *-*ēr-i*). The form *-ērunt* is based upon *-ēre*, with the active/aorist 3rd person plural ending *-unt* added (cf. Sihler 1995:589; Buck 1933:296).

As noted by Fortson (2004:94 and 2010:104), lack of reduplication in this stem is taken by some scholars to be a relic from a time when reduplication was not a mandatory feature of the perfect. This view is not shared by all scholars, however.

The imperative also had a special set of personal endings. In athematic verbs, either the bare stem could be used to indicate the 2nd singular imperative or the particle *-d^hi could be added to the bare stem instead: Vedic *śru-dhí* 'listen!'; Greek ἴ-θι 'go!'. In thematic verbs, however, the thematic vowel alone was used to indicate the 2nd singular imperative without any additional ending: Proto-Indo-European *$b^hér$-*e* 'carry!' > Sanskrit *bhára*; Greek φέρε. In the 2nd plural imperative, for both thematic and athematic stems, the personal ending *-t^he was used: Proto-Indo-European 2nd plural imperative thematic *$b^hér$-*e*-t^he 'carry!' > Sanskrit *bhárata*; Greek φέρετε. There were also special 3rd singular and plural imperative endings in *-*u*: 3rd singular imperative personal ending *-t^hu, 3rd plural imperative personal ending *-nt^hu. The *-*u* imperative forms are found in Hittite as well. The imperative personal endings are summarized in the following table (cf. Szemerényi 1996:247; Sihler 1995:601):

	Active		Middle
	Athematic	Thematic	
Singular			
2	*-Ø, *-d^hi	*-*e*	*-*so*
3	*-t^h(+ *u*)	*-*e*-t^h(+ *u*)	*-t^ho
Plural			
2	*-t^he	*-*e*-t^he	*-d^hwo
3	*-ent^h(+ *u*)	*-ont^h(+ *u*)	*-nt^ho

The 2nd singular and the 3rd singular and plural middle forms given above are reconstructed on the basis of what is found in Greek and Latin. They are clearly

derived from the active/aorist personal endings through the addition of *-*o*. Only the 2nd plural imperative ending is derived from the regular middle endings. These forms are not ancient — Meier-Brügger (2003:181), for one, considers them to be post-Proto-Indo-European.

Finally, it should be noted that the 3rd singular and plural "future" imperative endings in Greek, Italic, and Celtic go back to *-$t^hōt^h$ (traditional *-*tōd* < *-*to-od*) and *-$nt^hōt^h$ (traditional *-*ntōd*) respectively: Archaic Latin *da-tōd* 'he shall give'. In Sanskrit, the corresponding ending is -*tāt* (cf. Burrow 1973:349—350), which is used for both the 2nd and 3rd singular as well as the 2nd plural imperative (but not the 3rd plural). According to Szemerényi (1996:248), this ending was derived from the ablative singular of the pronoun *t^ho- (*$t^hōt^h$ < *t^ho-ot^h), which was simply appended to the verbal stem (see also Brugmann 1904:558). Szemerényi notes that it meant something like 'from there, thereafter', which accounts for its future reference.

For more information on the imperative endings, cf. Beekes 2011:276—277; Brugmann 1904:557—558; Fortson 2004:95 and 2010:105; Sihler 1995:601—606; Meier-Brügger 2003:181; Meillet 1964:235—237; Szemerényi 1996:247—249.

19.14. THE PERSONAL ENDINGS IN ANATOLIAN

Compared to what is found in non-Anatolian Indo-European daughter languages such as Sanskrit, Greek, Latin, Lithuanian, and Old Church Slavic, Anatolian verbal morphology was a model of simplicity (for more information on Anatolian verbal morphology, cf. Melchert 1994b:132—134; Hoffner—Melchert 2008:173—234; Luraghi 1997:27—44 and 1998:182—186; Meriggi 1980:330—366; Sturtevant 1951:116—165; J. Friedrich 1960.I:73—114; Jasanoff 1979 and 2003; Kronasser 1956:162—215 and 1966.1:366—590; Werner 1991:34—35). We have already remarked that the dual number was absent in Anatolian (cf. Melchert 1994b:132). There were three persons, as elsewhere (cf. Melchert 1994b:132). There were two moods (indicative and imperative), two tenses (present-future and preterite), and two voices (active and middle) (cf. Melchert 1994b:132; Luraghi 1997:27—28 and 1998:182; Sturtevant 1951:118). The present tense served as the basis for the future (cf. Melchert 1994b:132). The present in the middle voice (at least in the 3rd person) was characterized by a suffix *-*r* similar to what is found in Latin, Celtic, and Tocharian (cf. Yoshida 1990; Melchert 1994b:132). Though simple thematic verbal stems were rare at best in Anatolian, root athematic stems were quite common (cf. Fortson 2010:173; Melchert 1994b:133). The aorist did not exist, nor did the imperfect. Though not all of the aspectual distinctions are completely clear yet (cf. Melchert 1994b:133), iterative/intensive and inchoative aspects have been identified (cf. Luraghi 1997:29—31). Hittite is noted for periphrastic forms constructed mainly with the verbs 'to be' (*eš*-) and 'to have' (*ḫark*-) plus the past participle (cf. Melchert 1994b:133; Luraghi 1997:37—44 and 1998:185; Boley 1992b; Sturtevant 1951:148—149). An important characteristic of Hittite was the presence of two conjugational types: the so-called "*mi*-conjugation" and the "*ḫi*-conjugation" (cf. Sturtevant 1951:118; Melchert 1994b:134; Luraghi 1998:182—183).

While the *mi*-conjugation corresponds unambiguously to similar types in the non-Anatolian Indo-European daughter languages (cf. Luraghi 1998:182—183), the nature of the relationship of the *ḫi*-conjugation to what is found elsewhere has not yet been completely clarified (cf. Luraghi 1998:184; Fortson 2010:173; Jasanoff 2003).

The present indicative active verbal endings were as follows (cf. Luraghi 1997:34—35 and 1998:183; Meriggi 1980:334; Kronasser 1956:187; Werner 1991: 34—35; Hoffner—Melchert 2008:181):

	Hittite	Palaic	Cuneiform Luwian	Hiero. Luwian	Lycian	Lydian
1st sg.	*-mi*, *-(ḫ)ḫi*		*-wi*	*-w*, *-wi*		*-u*, *-v*
2nd sg.	*-ši*, *-ti*	*-ši*, *-ti*	*-ši*	*-ši*		*-s*
3rd sg.	*-zi*, *-i*	*-ti*, *-i*	*-ti*, *-i*	*-ti*, *-i* (?)	*-t/di*	*-t*, *-d*
1st pl.	*-weni*	*-wani*				
2nd pl.	*-teni*			*-tani*		
3rd pl.	*-anzi*	*-anti*	*-(a)nti*	*-(a)nti*	*-ti*	*-t*, *-d*

The preterite indicative active endings were:

	Hittite	Palaic	Cuneiform Luwian	Hiero. Luwian	Lycian	Lydian
1st sg.	*-un*, *-(ḫ)ḫun*	*-ḫa*	*-ḫa*	*-ha*	*-χa*	*-v*, *-(i)dv*
2nd sg.	*-š*, *-(š)ta*	*-iš*	*-š*			
3rd sg.	*-t(a)*, *-(š)ta*	*-i*	*-ta*	*-ta*	*-te*	*-l*
1st pl.	*-wen*		*-man*	*-min*		
2nd pl.	*-ten*					
3rd pl.	*-er*	*-(a)nta*	*-(a)nta*	*-(a)nta*	*-te*	

The middle is only attested in Hittite with certainty (cf. Luraghi 1998:183):

	Present	Preterite
1st sg.	*-ḫa*, *-ḫari*, *-ḫaḫari*	*-ḫar(i)*, *-ḫaḫat(i)*
2nd sg.	*-ta*	*-ta*, *-tat(i)*
3rd sg.	*-ta*, *-tari*, *-a*, *-ari*	*-(t)at(i)*
1st pl.	*-wašta*, *-waštari*, *-waštati*	*-waštat(i)*
2nd pl.	*-duma*, *-dumari*, *-dumati*	*-dumat*
3rd pl.	*-anta*, *-antari*	*-antat(i)*

Finally, the imperative endings were (cf. Meriggi 1980:350):

	Hittite	Palaic	Cuneiform Luwian	Hiero. Luwian	Lycian	Lydian
1st sg.	*-allu*, *-llu*		*-allu*			?
2nd sg.	*-Ø*, *-i*, *-t*					?
3rd sg.	*-tu*, *-u*	*-du*	*-(d)du*, *-(t)tu*	*-tu*	*-tu*, *-u*	?
1st p.	*-weni*					?
2nd pl.	*-ten*, *-tin*	*-ttan*	*-tan*	*-tanai*		?
3rd pl.	*-antu*, *-andu*	*-ndu*	*-ndu*, *-ntu*	*-(a)ntu*	*-tu*	?

In Hittite, the ending *-ru* could be added to the middle forms to create middle imperatives (cf. Sturtevant 1951:146).

The endings of the Hittite *ḫi*-conjugation are based upon the Proto-Indo-European stative endings, to which *-i* has been appended: Pre-Hittite **-ḫa+i*, **-ta+i*, **-a+i* > Hittite *-ḫi*, *-ti*, *-i* (cf. Beekes 2011:266; Drinka 1995:3; Jasanoff 2003:6). The 1st singular preterite ending *-ḫun* is a Hittite innovation. The original form of the 1st singular preterite ending, **-ḫa*, is preserved in the other Anatolian daughter languages: Palaic *-ḫa*, Cuneiform Luwian *-ḫa*, Hieroglyphic Luwian *-ha*, Lycian *-χa*. The origin of the Hittite *ḫi*-conjugation is thus clear, even if all of the details are not yet completely understood. The Proto-Indo-European stative has been changed into a present class in Hittite by the addition of *-i* to the stative personal endings in imitation of the *mi*-conjugation. The original forms of the endings of the stative have been partially preserved in the preterite, though the development of a distinct preterite here is an Anatolian innovation.

19.15. COMMENTS ON THE PERSONAL ENDINGS

While Anatolian nominal morphology provides a great deal of reliable information about Early Proto-Indo-European nominal morphology, Anatolian verbal morphology does not provide the same level of reliability. This is because, in addition to retaining many archaic features, the Anatolian languages have also innovated significantly in verbal morphology. Moreover, certain features may have been lost in Anatolian as well. Consequently, the evidence from the non-Anatolian Indo-European daughter languages plays a more crucial rule in determining Early Proto-Indo-European verbal morphology than it plays in determining early nominal morphology. Nevertheless, the impact of Anatolian has been no less profound.

We can say with complete confidence that the dual number did not exist in Early Proto-Indo-European verbal morphology — it was a later formation (cf. Kerns—Schwartz 1972:5). Simple thematic verbal stems may also be tentatively

regarded as later formations (cf. Watkins 1998:58; Kerns—Schwartz 1972:2—3; Meillet 1931). It appears that they were just beginning to develop at the time when the Anatolian languages separated from the main speech community. We should note here, however, that, except for the 1st person singular, the personal endings of the thematic stems were identical to those of the athematic stems. There were at least two tenses (present/future and preterite [= non-present]), two moods (indicative and imperative), and two voices (active and middle). The preterite was originally neutral as to tense (cf. Meier-Brügger 2003:166). There were two contrasting superordinate aspectual categories (dynamic and stative) (cf. Comrie 1976:48—51 for definitions). The dynamic aspect referred to actions and processes, while the stative aspect referred to states. There was also an iterative aspect.

The present/future and the preterite were built on the same set of personal endings. The distinguishing characteristic was a deictic particle *-*i* meaning 'here and now' that was appended to the personal endings to differentiate the present, while the undifferentiated endings were used to indicate the preterite, thus:

Person	Preterite	Present/Future
1st sg.	*-*m*	*-*m*-*i*
2nd sg.	*-*s*	*-*s*-*i*
3rd sg.	*-*t*^{h}	*-*t*^{h}-*i*
1st pl.	*-*me*	*-*me*-/*-*ma*-
2nd pl.	*-*t*^{h}*e*	*-*t*^{h}*e*
3rd pl.	*-*n̥t*^{h}/*-*ent*^{h}	*-*n̥t*^{h}-*i*/*-*ent*^{h}-*i*

These are the "secondary" and "primary" personal endings respectively of traditional Indo-European comparative grammar. The secondary endings were used to denote the aorist and imperfect in later Proto-Indo-European. At an even earlier date, before the *-*i* was appended to differentiate the present from the preterite, these endings merely indicated an action or a process without reference to time. A remnant of this earlier usage survives in the so-called "injunctive" (cf. Lehmann 2002:172—175). The future sense was denoted with the help of temporal adverbs or was understood from the context.

Next, there was a special set of personal endings for the stative (cf. Lehmann 2002:171):

Person	Endings
1st sg.	*-*H*$_2$*e*
2nd sg.	*-*t*^{h}*H*$_2$*e*
3rd sg.	*-*e*
1st pl.	*-*me*- (?)
2nd pl.	*-*e*
3rd pl.	*-*ēr*, *-*r̥s*

These are the endings that served as the basis for the Hittite *ḫi*-conjugation and for the perfect in the non-Anatolian daughter languages. Inasmuch as the stative indicated a mere state without reference to time, there was no differentiation between "primary" and "secondary" endings here (cf. Lehmann 2002:170; Kerns—Schwartz 1972:10—11). Moreover, except for the 3rd person plural, the plural endings seem to be later additions (cf. Lehmann 2002:169 and 171).

A separate set of middle endings must also be reconstructed for Early Proto-Indo-European:

Person	Secondary	Primary
1st sg.	*-H_2e	*-H_2e-*r*
2nd sg.	*-t^hH_2e	*-t^hH_2e-*r*
3rd sg.	*-t^h*a*, *-*a*	*-t^h*a*-*r*, *-*a*-*r*
1st pl.	*-*medH*	*-*medH*
2nd pl.	*-*dwe*	*-*dwe*
3rd pl.	*-nt^h*a*, *-*ra*	*-nt^h*a*-*r*, *-*ra*-*r*

The middle endings were built mostly on the stative endings (cf. Watkins 1962:98). However, the 3rd person singular and plural forms in *-t^h*a*- and *-nt^h*a*- respectively were imported from the active conjugation. The 1st and 2nd plural endings, on the other hand, were unique to the middle. The 1st plural was created by the addition of *-*dH* (> *-d^h*H*) to the 1st plural active ending *-*me*- (cf. Sihler 1995:477), while the origin of the 2nd plural ending *-*dwe* (> *-d^h*we*) is not known. The "primary" endings were distinguished from the "secondary" endings by the addition of a suffix *-*r*. The original meaning of the middle is clear. The middle was used to indicate that the subject was being acted upon — either the subject was performing the action on or for himself/herself, or the subject was the recipient but not the agent of the action (cf. Lehmann 1993:243; Gamkrelidze—Ivanov 1995.I:289—295). Thus, the middle was nothing other than a specialized form of the stative (cf. Lehmann 1993:218, 219, and 243; Luraghi 1998:184). Gamkrelidze—Ivanov (1995.I:288) note that the middle could only have arisen in Proto-Indo-European after subject-object relations and distinct forms for direct and indirect objects had appeared.

The last set of personal endings that we will examine are the imperative endings, which may be reconstructed as follows for Early Proto-Indo-European:

	Singular	Plural
2	*-Ø, *-*di*	*-t^h*e*
3	*-t^h*(+ u)*	*-ent^h*(+ u)*

The bare stem was the fundamental form of the 2nd person singular imperative (cf. Lehmann 1993:182; Szemerényi 1996:247; Meier-Brügger 2003:181). This could be further extended by a particle *-*di* (> *-d^h*i*), the meaning of which is unknown.

The 3rd person singular and plural imperative endings were the same as the active endings to which *-*u* was added, while the 2nd person plural imperative ending was identical with the 2nd person plural active ending (cf. Szemerényi 1996:247). The Anatolian first singular imperative ending *-*(a)llu* may indeed have been a remnant of an old hortatory ending as noted by Greenberg (2000:196). The *hortatory* was used to express an exhortation as in English 'let's go'.

We are not quite done yet. In addition to the regular personal endings of traditional grammar, there are irregular forms that need to be examined as well (cf. Villar 1991:248).

First, there is some evidence from Hittite and Tocharian for a 2nd singular active personal ending *-t^h (cf. Villar 1991:248; Malzahn 2010:30—31). In Hittite, this ending may be preserved in the 2nd singular active preterite ending *-ta* (cf., for example, 2nd sg. pret. *e-eš-ta* 'you were', *e-ip-ta* 'you took', *ku-en-ta* 'you struck', etc.). Note also the following Tocharian A athematic endings (cf. Adams 1988:55; Van Windekens 1976—1982.III:259—297; for paradigms, see Krause—Thomas 1960—1964.I:262—270; Winter 1998:167):

Person	Singular	Plural
1	*-(ä)m*	*-mäs*
2	*-(ä)t*	*-c*
3	*-(ä)ṣ*	*-(i)ñc*

Note: There are phonological problems with the 3rd singular ending *-(ä)ṣ* in Tocharian — had this been inherited directly from Proto-Indo-European *-*si*, we would expect *-(ä)s*, not *-(ä)ṣ*. The best explanation is that of Pedersen, who derived this ending from an enclitic *-*se*-. For details on the development of the personal endings in Tocharian, cf. Adams 1988:51—62; Van Windekens 1976—1982.II/2:259—297; Malzahn 2010:26—49.

Considering that the form of the 2nd plural personal ending was *-t^h*e*, it would make sense if the original form of the 2nd singular personal ending were *-t^h.

Next, there is also evidence for an original 3rd singular personal ending *-*s*. Watkins (1962:97—106) discusses the evidence from the Indo-European daughter languages for an original 3rd singular ending in *-*s* in great detail (though Watkins concludes that the *-*s*- was an enlargement rather than a personal ending — indeed, some, but not all, of the material examined by Watkins supports such an interpretation). It was Watkins who also showed that the 3rd singular indicative was originally characterized by the fundamental ending *zero* (see also Villar 1991:248). At a later date, the 3rd singular personal ending *-*s* was mostly replaced by the new 3rd singular personal ending *-t^h. This change must have occurred fairly early, however, since the *-t^h forms are found in Hittite and the other Anatolian daughter languages.

When the personal ending *-t^h was added to the 3rd singular, it must also have been added to the 3rd plural ending at the same time, yielding the new 3rd plural

ending *-*nt*^{h}. This leads us to conclude that the original form of the 3rd plural ending must have been *-*n*.

It thus appears that the earliest recoverable Proto-Indo-European active personal endings may have been as follows (cf. Villar 1991:249, who reconstructs an identical set of personal endings for the singular and 2nd person plural but not for the 1st and 3rd persons plural — Villar reconstructs *-*u̯e* for the 1st plural and *-*r* for the 3rd plural):

Person	Singular	Plural
1	*-*m*	*-*me*
2	*-*t*^{h}	*-*t*^{h}*e*
3	*-*s*, *-*Ø*	*-*en*

The important point in this proposal is the regularity between the 1st and 2nd persons singular and plural, which are constructed on the same elements, though it must be noted that there was also an alternative 1st plural ending *-*we*, as suggested by Villar (1991:249). That this alternative ending is ancient is shown by the fact that it is found in the Anatolian languages. The difference in form was due to an intraparadigmatic accent shift — the accent was placed on the root in the singular but on the ending in the plural, at least in athematic stems (cf. Burrow 1973:320). An important benefit of this reconstruction is that it provides a means to explain the 1st and 2nd person plural endings in *-*me*-*n*- (~ *-*we*-*n*-) and *-*t*^{h}*e*-*n*- respectively found, for example, in Greek and Anatolian. These endings may be seen as having been analogically remodeled after the 3rd plural. At a later date, this *-*n* was partially replaced by *-*s* in the 1st person plural in the other non-Anatolian Indo-European daughter languages: cf., for example, Sanskrit active 1st plural personal ending (primary) -*mas(i)* (as in Vedic *smási* 'we are', Classical Sanskrit *smás*, etc.). It may be noted here that there are alternative forms of the 2nd plural primary and secondary endings in -*na* in Sanskrit: (primary) -*thana*, (secondary) -*tana*. These are now to be seen as reflecting the older patterning and not as Sanskrit innovations (cf. Burrow 1973:309). The link between the *-*n* of 3rd person plural and the *-*n* of the 1st and 2nd persons plural was permanently broken when the 3rd person plural ending was extended by *-*t*^{h}, as indicated above. An alternative scenario is possible here — the *-*n* may be a remnant of an old plural ending. In this scenario, *-*n* and *-*s* would have been competing plural markers that could have optionally been added to the 1st plural personal endings, with *-*n* being the more archaic of the pair.

The fact that the same set of personal endings could be used interchangeably for the 2nd and 3rd persons singular in Hittite in the preterite (cf. Sturtevant 1951:141) seems to indicate that Hittite represents a transitional stage in which the arrangement of the endings had not yet been completely worked out. This gives us a clue about the chronology of the changes we have been talking about here — they must have begun just prior to the time when the Anatolian languages became separated from the main speech community.

19.16. THE FORMATION OF MOODS

As noted above, four moods are traditionally reconstructed for later Proto-Indo-European: indicative, subjunctive, optative, and imperative. Inasmuch as the indicative was the default mood, there were no special markers to distinguish the indicative (cf. Szemerényi 1996:257). Moreover, we have already discussed the imperative in the section on personal markers. Therefore, only the subjunctive and optative require explanation in this section. This is also the place to mention the so-called "injunctive".

SUBJUNCTIVE: The subjunctive was constructed on the indicative stem and was distinguished by the connecting vowel *-*e/o*-, which was inserted between the bare stem and the personal endings in the case of athematic verbs or between the thematic vowel and the personal endings in the case of thematic verbs (cf. Szemerényi 1996:257; Fortson 2010:105—106; Meier-Brügger 2003:176—177), as illustrated by the following examples (athematic *H_1*es*- 'to be', thematic *b^h*er-e/o*- 'to bear, to carry'; note that the accent is on the root throughout the paradigm, and the full-grade vowel is retained in the root as well [cf. Beekes 2011:274—275; Sihler 1995:593]):

	Athematic	Thematic		
Singular				
1	*H_1*és-o-H_2	*b^h*ér-e-oH_2	>	*b^h*ér-ō-H_2
2	*H_1*és-e-s(i)	*b^h*ér-e-e-s(i)	>	*b^h*ér-ē-s(i)
3	*H_1*és-e-t^h(i)	*b^h*ér-e-e-t^h(i)	>	*b^h*ér-ē-t^h(i)
Plural				
1	*H_1*és-o-me-	*b^h*ér-o-o-me-	>	*b^h*ér-ō-me-
2	*H_1*és-e-t^he	*b^h*ér-e-e-t^he	>	*b^h*ér-ē-t^he
3	*H_1*és-o-nt^h(i)	*b^h*ér-o-o-nt^h(i)	>	*b^h*ér-ō-nt^h(i)

As noted by Fortson (2010:106), the subjunctive is only continued in Indo-Iranian, Greek, Celtic, and Latin. However, it has been modified in each of these branches. The subjunctive usually has future meaning in Indo-Iranian (cf. Sihler 1995:592; Fortson 2010:106). Only in Greek has the subjunctive retained its original meaning, though, even there, future meaning is not unknown (Fortson 2010:106 and Palmer 1980:309 cite examples from Homeric Greek). In Latin, what was originally the subjunctive always has future meaning (cf. Beekes 2011:274; Sihler 1995:594—595; Meillet 1964:224; Palmer 1954:271—272). Its limited distribution indicates that the subjunctive was a relatively late formation (cf. Burrow 1973:348; Kerns—Schwartz 1972:24—25). It did not exist in Anatolian. The situation is actually quite a bit more complicated than indicated in this brief discussion, and descriptive and comparative grammars for the individual daughter languages should be consulted for details; see also Hahn 1953 and Gonda 1956:68—116.

OPTATIVE: In athematic stems, the optative was characterized by a special suffix (*-*yeH*$_1$- [> *-*yē*-] in the singular and *-*iH*$_1$- [> *-*ī*-] in the plural), after which the secondary endings were added (cf. Brugmann 1904:554—557; Meillet 1964:224—226; Szemerényi 1996:259—261; Beekes 2011:275—276; Fortson 2010:106—107; Meier-Brügger 2003:177; Sihler 1995:595—600; Burrow 1973:350—353; Haudry 1979:75). Again, the verb *H_1*es*- 'to be' may be cited:

	Singular			Plural		
1	*H_1*s-yéH$_1$-m*	>	*s-yē-m*	*H_1*s-iH$_1$-mé*	>	*s-ī-me*
2	*H_1*s-yéH$_1$*-s	>	*s-yē-s*	*H_1*s-iH$_1$-t^{h}é*	>	*s-ī-t^{h}e*
3	*H_1*s-yéH$_1$-t^h*	>	*s-yē-t^h*	*H_1*s-iH$_1$-ént^h*	>	*s-iy-ent^h*

As noted by Szemerényi (1996:259), this paradigm is most clearly preserved in Old Latin: (singular) *siem*, *siēs*, *siet*; (plural) *sīmus*, *sītis*, *sient*.

In thematic stems, the reduced-grade form of this suffix (*-*iH*$_1$-) was added after the thematic vowel, after which the secondary endings were added. The verb *b^{h}er-e/o- 'to bear, to carry' may be cited again here (note that the accent is on the root throughout the paradigm, and the full-grade vowel is retained in the root as well):

	Singular			Plural		
1	*b^{h}ér-o-iH$_1$-m*	>	*b^{h}ér-o-y-m̥*	*b^{h}ér-o-iH$_1$-me*	>	*b^{h}ér-o-i-me*
2	*b^{h}ér-o-iH$_1$-s*	>	*b^{h}ér-o-i-s*	*b^{h}ér-o-iH$_1$-t^{h}e*	>	*b^{h}ér-o-i- t^{h}e*
3	*b^{h}ér-o-iH$_1$-t^h*	>	*b^{h}ér-o-i-t^h*	*b^{h}ér-o-iH$_1$-nt^h*	>	*b^{h}ér-o-y-n̥t^h*

The optative did not exist in Anatolian, which indicates that it was a later development within Proto-Indo-European (cf. Meier-Brügger 2003:178; Fortson 2004:96 and 2010:107).

INJUNCTIVE: Though often treated as a separate mood (cf. Beekes 2011:273—274; Brugmann 1904:579—583; Szemerényi 1996:263—266), the so-called "injunctive" actually falls outside of formal categories such as tense and mood (cf. Buck 1933:238; MacDonell 1916:349—352; Lehmann 2002:174; Burrow 1973:346; Gonda 1956:33—46). It is found only in Indo-Iranian as a separate formation (cf. Meillet 1964:247; Beekes 2011:273—274; Kent 1953:74), and, even there, it is often difficult to determine its meaning (cf. Fortson 2010:101) — it can be translated into English as a past tense or as a present tense; it can have subjunctive or optative or imperative modality (cf. Hahn 1953:38; Szemerényi 1996:264—265). It was characterized by secondary personal endings and by the absence of the augment. It was particularly common in prohibitions: cf. Vedic *mā́ bhaiṣīḥ* 'do not be afraid', *mā́ na indra párā vṛṇak* 'do not, O Indra, abandon us', *mā́ bharaḥ* 'do not carry' (cf. Hahn 1953:38; Meillet 1964:247; Beekes 2011:273—274; Lehmann 2002:172; Meier-Brügger 2003:255—256; MacDonell 1916:351). Except for

prohibitions, the injunctive went out of use in post-Vedic Sanskrit (cf. Burrow 1973:346).

The injunctive is best seen as a remnant of the earlier verbal system (cf. Lehmann 2002:172; Gonda 1956:33—46; Szemerényi 1996:265; MacDonell 1916:349; Kerns—Schwartz 1972:4). It indicated an action or a process without reference to time (cf. K. Hoffmann 1967:265—279; P. Kiparsky 2005; Lehmann 2002:173; Meier-Brügger 2003:255).

19.17. FORMATION OF TENSES

We have already noted that Late Proto-Indo-European is traditionally assumed to have had the following tenses: present, imperfect, aorist, and perfect. Though there have been attempts to show that Late Proto-Indo-European also had pluperfect and future tenses, these proposals have not met with wide acceptance. To avoid confusion, it must be stressed here that I assume a slightly different situation for early (Pre-Anatolian) Proto-Indo-European — during that stage of development, I posit two tenses: a present/future and a preterite (= non-present). There was no special marker to distinguish the present from the future then — they were identical in form, both being built from the same set of personal endings, as in Hittite. It was not until much later, in Disintegrating Indo-European, or, better, in the formative stages of the individual non-Anatolian daughter languages themselves, that distinct future formations arose (cf. Kerns—Schwartz 1972:19—20) — we have already seen how the subjunctive developed into a future in Latin.

In Late Proto-Indo-European, a variety of tense formations could be made within each modal category, similar to what is reflected in the older non-Anatolian daughter languages. For example, Szemerényi (1996:266) notes that Latin had six tenses in the indicative, four in the subjunctive, and two in the imperative. He also notes that a perfect imperative form still survives in Latin in *mementō (te)*. According to Burrow (1973:298—299), Sanskrit had the following five moods: injunctive, imperative, subjunctive, optative, and precative. The precative (which is also sometimes called “benedictive”) was a form of the optative in which an *-s* was added after the modal suffix. It was built almost exclusively from aorist stems and was used to express a prayer or a wish addressed to the gods (cf. MacDonell 1916:367). Burrow further notes that, in the older language, modal forms could be made from present, aorist, and perfect stems without any apparent difference in meaning (see also Whitney 1889:201—202, §533). Ancient Greek was likewise quite intricate. Greek had seven tenses in the indicative (present, imperfect, future, aorist, perfect, pluperfect, and future perfect), three in the subjunctive (present, aorist, and perfect), five in the optative and infinitive (present, future, aorist, perfect, and future perfect), and three in the imperative (present, aorist, and perfect) (cf. Smyth 1956:107, §359). Let us look at each tense in turn (the following discussion has been adapted from Szemerényi 1996:266—313).

PRESENT STEMS: The formation of present stems was complicated. Present stems could be thematic or athematic, active voice or middle voice or even both, underived (= root stems) or derived (from verbal stems or from nominal stems) (cf. Kerns—Schwartz 1972:6—8).

A. ATHEMATIC ROOT STEMS: Athematic root stems consisted of the simple verbal root without further extension. In this type of verbal stem, there was an intraparadigmatic alternation of accent and ablaut between the singular and the plural — in the singular, the accent fell on the root, and the vowel of the root appeared in its full-grade form, while, in the plural, the accent was shifted to the ending, and the vowel of the root appeared in its zero-grade form (that is, it was lost) (cf. Burrow 1973:320). This is an ancient type. (A small number of athematic root stems exhibit fixed root accent — that this type is also ancient is shown by the fact that it is found in Hittite [such as in *wek-* 'to demand'].) The more common type (with intraparadigmatic accent shift) may be illustrated by the following examples (only the singular and plural forms are given):

	*H_1*es-* 'to be'	*H_1*ey-* 'to go'	*g^{wh}*en-* 'to slay'
Singular			
1	*H_1*és-mi*	*H_1*éy-mi*	*g^{wh}*én-mi*
2	*H_1*és-si*	*H_1*éy-si*	*g^{wh}*én-si*
3	*H_1*és-t^h*i*	*H_1*éy-t^h*i*	*g^{wh}*én-t^h*i*
Plural			
1	*H_1*s-més*	*H_1*i-més*	*$g^{wh}\underset{\circ}{n}$*-més*
2	*H_1*s-t^h*é*	*H_1*i-t^h*é*	*$g^{wh}\underset{\circ}{n}$*-$t^h$*é*
3	*H_1*s-ént^h*i*	*H_1*y-ént^h*i*	*g^{wh}*n-ónt^h*i*

B. SIMPLE THEMATIC STEMS: Simple thematic stems consisted of the simple verbal root followed by the thematic extension *-*e/o*-. Unlike the athematic type mentioned above, there was no intraparadigmatic accent and ablaut alternation. However, there were two distinct types of simple thematic stems. In the first, the accent was fixed on the root throughout the paradigm, and the root also retained its full-grade vowel. In the second, the accent was fixed on the thematic vowel throughout the paradigm, while the root appeared in its reduced-grade form (these were the sixth-class present stems in Sanskrit of the type represented by *tudáti* 'strikes' [cf. Burrow 1973:329—330]). The first type was far more common than the second, which was actually rather rare. Simple thematic stems first arose around the time that the Anatolian languages split off from the main speech community. They became increasingly common in later Proto-Indo-European and are the most common type in the older non-Anatolian Indo-European daughter languages (cf. Burrow 1973:328; Watkins 1998:58). The first type may be illustrated by *weg^h*-e/o*- 'to carry, to convey, to weigh' (only the singular and plural forms are given):

	Singular	Plural
1	**wégʰ-o-H₂*	**wégʰ-o-mes*
2	**wégʰ-e-si*	**wégʰ-e-tʰe*
3	**wégʰ-e-tʰi*	**wégʰ-o-ntʰi*

C. REDUPLICATED STEMS: In this type of formation, the root is repeated, either in part or in whole. Szemerényi (1996:268—269) distinguishes the following types of reduplication: (A) total replication of the root (this is also called "intensive" reduplication or "full" reduplication [see above]); (B) total replication of the root, with a vowel (usually *-ĭ-*) inserted between the reduplicated elements; (C) "symbolic" reduplication, in which only part of the root is replicated (this is also called "partial" reduplication or "normal" reduplication). As a general rule, the vowel of the root appeared in the reduplicated syllable in the case of partial reduplication. However, the vowel **-i-* could be substituted instead. This is typically the case in Greek, which almost always has -ι- in the reduplicated syllable, though it should be noted that Sanskrit is more flexible in this regard (cf. Burrow 1973:322). The position of the accent was also somewhat unstable — it could fall on the reduplicated syllable, or it could fall on the root instead (cf. Burrow 1973:322—323). Both thematic and athematic types were found. These were the third-class or *hu*-class reduplicating present stems of Sanskrit grammar of the type represented by *ju-hó-mi* 'I sacrifice' (cf. Burrow 1973:322—323). Reduplicated inflection may be illustrated by the verb **dʰe-dʰeH₁-* 'to put, to place' (Greek points to **dʰi-dʰeH₁-*) (only the singular and plural forms are given) (cf. Sihler 1995: 457):

	Singular	Plural
1	**dʰe-dʰeH₁-mi*	**dʰe-dʰH̥₁-mos*
2	**dʰe-dʰeH₁-si*	**dʰe-dʰH̥₁-tʰe*
3	**dʰe-dʰeH₁-tʰi*	**dʰe-dʰH₁-n̥tʰi*

D. STEMS WITH NASAL INFIX: **-n-* occupied a special position in verbal derivation in Proto-Indo-European. Unlike other derivational elements, **-n-* was inserted as an infix into type II verbal stems (**CCV́C-*) according to the following pattern: **CC-n-éC-* (cf. Benveniste 1935:159—163 [note especially the table on p. 161]; see also Szemerényi 1996:270—271; Sihler 1995:498—501; Watkins 1998:57; Fortson 2010:97; Lehmann 1993:170—171), but only when the verbal stems ended in obstruents or laryngeals (cf. Lehmann 2004:118). These were the seventh-class present stems of Sanskrit grammar. As noted by Watkins (1998:57) (see also Szemerényi 1996:271), this type was most faithfully preserved in Indo-Iranian. The original system was modified in the other Indo-European daughter languages — typically, they have become thematic formations, as in Latin *findō* 'to split, to cleave', *linquō* 'to leave, to

abandon, to forsake, to depart from', etc. The fact that the thematic formations are also found in Indo-Iranian indicates that the original system was already moribund at the time of the emergence of the individual non-Anatolian Indo-European daughter languages. This type may be illustrated by **yu-n-ék'-* (traditional **yu-n-ég-*) 'to join' (only the singular and plural forms are given; the Sanskrit forms are also listed for comparison [cf. Burrow 1973:327]):

	Proto-Indo-European	Sanskrit
Singular		
1	**yu-n-ék'-mi*	*yunájmi*
2	**yu-n-ék'-si*	*yunákṣi*
3	**yu-n-ék'-t^{h}i*	*yunákti*
Plural		
1	**yu-n-k'-més*	*yuñjmás*
2	**yu-n-k'-t^{h}é*	*yuṅktthá*
3	**yu-n-k'-ént^{h}i*	*yuñjánti*

Szemerényi (1996:270—271) points out that similar structures are found in the fifth-class and ninth-class present stems of Sanskrit grammar, and he cites Sanskrit *śru-* 'to hear' (< Proto-Indo-European **k^{h}lew-*; cf. Greek κλύω 'to hear'; Latin *clueō* 'to hear oneself called, to be called, to be named') and (3rd sg. pres.) *pávate* 'to make clean, to cleanse, to purify' (< Proto-Indo-European **p^{h}ewH$_2$-/*p^{h}uH$_2$-*; cf. **pŭ-* in Latin *putō* 'to cleanse, to clear', *pūrus* 'clean, pure') as examples (see also Meier-Brügger 2003:170), thus:

Proto-Indo-European	Sanskrit
**k^{h}lew-/*k^{h}lu-*	*śru-*
**k^{h}l̥-n-éw-t^{h}i*	*śṛṇóti*
**p^{h}ewH$_2$-/*p^{h}uH$_2$-*	*pávate*
**p^{h}u-n-éH$_2$-t^{h}i*	*punā́ti*

E. **-sk^{h}-* FORMATIONS: The fact that verbal formations employing this suffix are found in Hittite indicates that this type is ancient. In Hittite, this suffix forms iteratives, duratives, or distributives (cf. Luraghi 1997:28 and 1998:185; Kronasser 1966.1:575—576; Beekes 2011:257; Sturtevant 1951:129—131; Sihler 1995:506) — an iterative or durative meaning seems to be its original function (cf. Szemerényi 1996:273; Sihler 1995:507; Meillet 1964:221). This suffix is always thematic and accented and is attached to roots in the zero-grade (cf. Szemerényi 1996:273; Watkins 1998:59; Meier-Brügger 2003:171; Fortson 2010:99; Beekes 2011:257; Sihler 1995:505; Watkins 1998:59). This type may be illustrated by **p^{h}rek^{h}-* (**prek̂-* in Brugmann's transcription) 'to ask' and

k'ʷem-* (gᵘem-* in Brugmann's transcription) 'to come' (the 3rd sg. pres. active is cited; Sanskrit forms are also listed for comparison):

Proto-Indo-European	Sanskrit
**pʰr̥kʰ-skʰé-tʰi*	*pr̥cchá́ti*
**k'ʷm̥-skʰé-tʰi*	*gácchati*

F. **-yo-* FORMATIONS: This was a very common suffix in Late Proto-Indo-European verb morphology (cf. Szemerényi 1996:274; Sihler 1995:502—503; Fortson 2010:98; Meier-Brügger 2003:173; Meillet 1964:211 and 217—220). It was used to create present stems from both verbs ("deverbal" or "deverbative" stems) and nouns ("denominal" or "denominative" stems) (cf. Watkins 1998:58). These were the fourth-class or *ya*-class present stems of Sanskrit grammar. There were two basic types: (A) accented suffix, with root in zero-grade and (B) accented root, with both root and suffix in normal grade. It seems that the former was the more ancient type (cf. Sihler 1995:503; Burrow 1973:330). There were several subtypes as well (for details, cf. Beekes 2011: 255—256; Brugmann 1904:523—537; Szemerényi 1996:274—279). The basic types may be illustrated by (A) **k'ʷem-* 'to come' and (B) **spʰekʰ-* 'to see' (forms from various daughter languages are also listed for comparison):

	Proto-Indo-European	Daughter Languages
A.	**k'ʷm̥-yé/ó-*	Greek βαίνω; Sanskrit *gamyáte*
B.	**spʰékʰ-ye/o-*	Latin *speciō*; Sanskrit *páśyati*; Greek σκέπτομαι (metathesis from **spʰékʰ-ye/o-*)

The various **-yo-* formations attested in the individual Indo-European daughter languages most likely had more than one origin (cf. Kerns—Schwartz 1972:8; Fortson 2010:98—99; Sihler 1995:502) — Szemerényi (1996:277) notes that at least three different classes may be posited. He also notes that these classes "for the most part were again mixed in the individual languages".

G. CAUSATIVE(-ITERATIVE) FORMATIONS: Late Proto-Indo-European could form causatives by adding the accented suffix **-éye/o-* to the *o*-grade form of the root (cf. Meier-Brügger 2003:173; Fortson 2010:99; Watkins 1998:58; Meillet 1964:211—212; Beekes 2011:256; Lehmann 1993:168; Kerns—Schwartz 1972:8). Brugmann (1904:535—537) treats this as a subtype of the preceding. In several daughter languages (Greek and, in part, Slavic), this formation has an iterative meaning — consequently, this formation is often referred to as causative-iterative (cf. Watkins 1998:58; Fortson 2010:99). According to Meier-Brügger (2003:173), this formation conveyed the meaning "a cause of bringing about a state of affairs, or the repeated bringing about of a state of

affairs". This type may be illustrated by **wes-* 'to clothe', causative **wos-éye/o-*, and **men-* 'to think', causative **mon-éye/o-* (forms from various daughter languages are also listed for comparison):

Proto-Indo-European	Daughter Languages
**wos-éye/o-*	Sanskrit *vāsáyati*; Gothic *wasjan*
**mon-éye/o-*	Sanskrit *mānáyati*; Latin *moneō*

This suffix is also found in Hittite (cf. 3rd sg. *wa-aš-ši-e-iz-zi*, *wa-aš-še-iz-zi*, and *wa-aš-ši-ya-zi* 'to get dressed, to put on clothes') (cf. Kronasser 1966.1:467—511 for details). In Hittite, however, the regular causative conjugation was formed with the suffix **-new-/*-nu-* (cf. Luraghi 1997:28; Sturtevant 1951:127—128; Kronasser 1966.1:438—460). Luraghi (1997:28) notes that this suffix could derive transitive verbs from adjectives or from intransitive verbs, or it could derive ditransitive verbs from transitive verbs. Causatives could also be formed in Hittite by means of the infix *-nen-/-nin-* (cf. Kronasser 1966.1:435—437). As noted by Luraghi (1997:28), causatives in *-nu-* were much more frequent than causatives in *-nen-/-nin-*.

The causative(-iterative) conjugation reconstructed for Proto-Indo-European on the basis of the non-Anatolian Indo-European daughter languages is best seen as a later, post-Anatolian development. Though the same type of formation is found in Hittite, its use as the regular means to indicate the causative(-iterative) did not arise until later. It was constructed on pre-existing thematic stems, extended with the suffix **-ye/o-* (cf. Kerns—Schwartz 1972:8).

H. ADDITIONAL FORMATIONS: Szemerényi (1996:279) lists a number of additional, less productive present formations, such as those in dentals and **s* (other formations are listed by Meillet 1964:222—223).

Mention should be made at this point of the factitive suffix **-H_2-*, which was added to adjectives to form verbs with the meaning 'to make something become what the adjective denotes' (cf. Watkins 1998:59; Fortson 2010:99—100; Meier-Brügger 2003:168; see also Sturtevant 1951:124—126). This formation may be illustrated by **new-eH_2-* 'to make new, to renew', from the adjective **new-o-s* 'new' (for Proto-Indo-European, the 3rd sg. pres. active is cited; forms from Hittite and Latin are also listed for comparison):

Proto-Indo-European	Daughter Languages
**new-eH_2-t^{h}i*	Hittite (1st sg. pret.) *ne-wa-aḫ-ḫu-un*; Latin (inf.) *(re)novāre* (< **new-ā-*)

AORIST STEMS: As noted above, the aorist indicated an action or an event that occurred once and was completed in the past. There were two distinct types of aorist formations in Late Proto-Indo-European: (A) the sigmatic aorist, in which

*-*s*- was added to the verbal root, and (B) asigmatic aorist, without *-*s*-. In Indo-Iranian, the sigmatic aorist was accompanied by lengthened-grade of the root in the active (cf. Szemerényi 1996:282; Beekes 2011:262—263), and there is evidence from Slavic and Italic pointing in the same direction (cf. Fortson 2010:102). However, Drinka (1995:8—33) argues that this was a secondary development and should not be projected back into Proto-Indo-European, though Szemerényi (1996:282) maintains that lengthened-grade was original. The asigmatic aorist itself contained two subtypes: (A) the root (athematic) aorist, in which the personal endings were added directly to the root, and (B) the thematic aorist, which, as the name implies, was characterized by presence of the thematic vowel *-*e/o*- between the root and the personal endings. In the root asigmatic aorist, the root had full-grade in the active singular but reduced-grade elsewhere. In the thematic asigmatic aorist, on the other hand, the root had reduced-grade (or zero-grade) throughout the paradigm (cf. Szemerényi 1996:281). Finally, a reduplicated aorist can also be reconstructed for Late Proto-Indo-European (cf. Szemerényi 1996:281; Fortson 2010:102—103). The aorist was characterized by secondary personal endings and, in Indo-Iranian, Greek, Armenian, and Phrygian (cf. Brixhe 1994:173 and 2004: 785; Diakonoff—Neroznak 1985:22), by the presence of the so-called "augment".

Inasmuch as the aorist did not exist in Anatolian, it must have arisen in later, post-Anatolian Proto-Indo-European. Its development is fairly transparent. The asigmatic type was the most ancient. It was constructed on the preterite forms (with so-called "secondary endings") reconstructed above for Early Proto-Indo-European (cf. Austefjord 1988:23—32) and originally exhibited an intraparadigmatic accent and ablaut variation in the root similar to what was found in the present stems. Thematic variants came into being in the aorist at the same time that they began to appear in the present. The thematic variants were accented on the thematic vowel throughout the paradigm, and the root had reduced-grade (or zero-grade). The next change was the development of the sigmatic aorist. According to Fortson (2010:102), the characteristic *-*s*- of the sigmatic aorist was most likely derived from the 3rd singular active preterite ending *-*s*- found, for example, in the Hittite *ḫi*-conjugation (cf. *na-(a-)iš* 'he/she led, turned, drove', *(a-)ak-ki-iš* 'he/she died', *a-ar-aš* 'he/she arrived', *ka-ri-pa-aš* 'he/she devoured', *ša-ak-ki-iš* 'he/she knew', etc.) (see also Drinka 1995:141—143). The next change was the development of lengthened-grade forms in the active in the sigmatic aorist (though not in Greek). The final change was the addition of the augment in Indo-Iranian, Greek, Armenian, and Phrygian. These last two changes belong to the early prehistory of the individual daughter languages and should not be projected back into Proto-Indo-European. Cf. Jasanoff 2003:174—214 for original and stimulating ideas about the possible origin of the sigmatic aorist (but these ideas are rejected by Ronald I. Kim 2005:194).

For an excellent discussion of the differences and similarities between the present and the aorist, cf. Meillet 1964:247—250. One of the things that comes out quite clearly from Meillet's discussion is that the semantic nuances between the present, aorist, and imperfect are often quite subtle.

IMPERFECT STEMS: The imperfect was formed directly from the present stem (cf. Fortson 2010:100—101). At the same time, it was closely related to the aorist (cf. Burrow 1973:333). It was used to indicate an action or an event occurring at some unspecified point in the past, with no indication that the action had come to an end. Thus, the distinction between the aorist and the imperfect was that the former indicated completed action in the past, while the latter indicated continuous action in the past. Thus, in terms of aspect, the aorist was *perfective*, and the imperfect was *imperfective* (Sihler 1995:446—447 uses the terms "punctual" and "durative", but see Comrie 1976:16—40 for a description of "perfective" and "imperfective" aspects and 41—44 for a discussion of the difference between "punctual" and "durative"). Like the aorist, it had secondary endings, and, in Indo-Iranian, Greek, Armenian, and Phrygian, it was also characterized by the presence of the augment (cf. Fortson 2010:101). There were both thematic and athematic types. Various means were used to distinguish the aorist from the imperfect in later Proto-Indo-European and in the individual non-Anatolian daughter languages, the most significant being the development of sigmatic forms in the aorist. Nothing comparable existed in the imperfect. There was also a close relationship between the imperfect and the injunctive (they are treated together by Fortson 2010:100—101), and the injunctive is often described as an imperfect without the augment (cf. Burrow 1973:346; Meillet 1964:247; Beekes 2011:273—274).

Szemerényi (1996:303) traces the development of aorist and imperfect as follows:

> The opposition of present to aorist, at first simply an opposition of present to non-present (directed towards the past), had to change fundamentally as and when a second past tense, formed directly from the present stem, was created; the binary opposition **bhéugeti* : **(é)bhuget*, whereby the old preterite became for the first time properly the aorist, while the new preterite, identical with the present in its stem, i.e. the imperfect of the south-east area, simply transferred the durative action to the past.

FUTURE STEMS: The future did not exist as a separate tense in Proto-Indo-European (cf. Szemerényi 1996:285; Beekes 2011:252; Sihler 1995:451 and 556; Kerns—Schwartz 1972:19). Consequently, the study of the sundry future formations that appear in the individual non-Anatolian Indo-European daughter languages properly belongs to those languages (for details, cf. Szemerényi 1996:285—288; Fortson 2010:100; Burrow 1973:332—333; Meillet 1964:215—216; Sihler 1995:556—559; Buck 1933:278—281; Palmer 1954:271—272 and 1980:310—312; Lindsay 1894: 491—494; Lewis—Pedersen 1937:289—292; Endzelins 1971:231—234).

19.18. NON-FINITE FORMS

Non-finite forms typically include *participles*, *infinitives*, *verbal nouns*, and *verbal adjectives*. Participles have qualities of both verbs and adjectives and can function as adjectival or adverbial modifiers. They can also be combined with auxiliary

verbs to form periphrastic verbal formations — a common development in the Indo-European daughter languages (cf. Meier-Brügger 2003:186—187), including Hittite (cf. Luraghi 1997:38—42 and 1998:185). Infinitives express existence or action without reference to person, number, tense, or mood and can also function as nouns.

Late Proto-Indo-European had a number of non-finite verbal forms, including participles and verbal adjectives (cf. Szemerényi 1996:317; Brugmann 1904:606—610; Fortson 2010:108; Sihler 1995:613—629; Haudry 1979:82—84; Adrados 1975.II:740—745). However, it did not have infinitives, though they did appear later in the individual Indo-European daughter languages (cf. Meier-Brügger 2003:184; Beekes 2011:280; Szemerényi 1996:317; Lehmann 1993:164—165; Adrados 1975.II:745—750). On the other hand, Late Proto-Indo-European must have had a variety of verbal nouns (so Beekes 2011:280—281, Brugmann 1904: 603—606, and Lehmann 1993:165, but not according to Szemerényi 1996:317 and Meier-Brügger 2003:184) — that this was indeed the case is shown by the fact that verbal nouns already existed in Hittite (cf. Luraghi 1997:37—38 and 1998:185—186; Lehmann 1993:165).

In Late Proto-Indo-European, the suffix *-*nt*^{h}- was used to form present and aorist participles in the active voice (cf. Szemerényi 1996:317—319; Meier-Brügger 2003:185; Fortson 2010:108; Meillet 1964:278; Adrados 1975.II:740—741 and II:742—744; Sihler 1995:613—618; Haudry 1979:83; Beekes 2011:279—280). For example, the present participle of *H_1*es*- 'to be' may be reconstructed as *H_1*s-(e/o)nt*^{h}- (cf. Sanskrit *sánt-* 'being'), while that of *b^{h}*er-e/o-* 'to bear, to carry' may be reconstructed as *b^{h}*er-e/o-nt*^{h}- (cf. Sanskrit *bhárant-* 'carrying'). This suffix is preserved in virtually all of the older non-Anatolian daughter languages. It is also found in Hittite. However, in Hittite, this suffix conveyed past meaning when it was added to non-stative verbs, but present meaning when added to stative verbs (cf. Luraghi 1997:38). Clearly, this suffix is ancient. The Hittite usage reflects the original situation (cf. Szemerényi 1996:318), while the usage found in the non-Anatolian daughter languages may be viewed as a later specialization (cf. Burrow 1973:368).

In the perfect (= stative), the suffix *-*wos*-/*-*us*- was used to form participles in Late Proto-Indo-European (cf. Szemerényi 1996:319—320; Meillet 1964:278—279; Schmitt-Brandt 1998:272; Meier-Brügger 2003:185—186; Fortson 2004:98 and 2010:108—109; Beekes 2011:279; Adrados 1975.II:741; Rix 1992:234—235; Sihler 1995:618—621; Haudry 1979:83). According to Szemerényi (1996:319), the original paradigm of the perfect participle for *weid- (= *weyt'-) 'to know' is to be reconstructed as follows (Szemerényi only gives the singular forms; his notation has been retained) (see also Beekes 2011:198):

	Masculine	Neuter	Feminine
Nominative	*weid-wōs	*weid-wos	*wid-us-ī
Accusative	*weid-wos-m̥	*weid-wos	*wid-us-īm
Genitive	*wid-us-os	*wid-us-os	*wid-us-yās
Dative	*wid-us-ei	*wid-us-ei	*wid-us-yāi

As noted by Sihler (1995:620), there is some disagreement about the form of the root in the above paradigm since the evidence from the non-Anatolian daughter languages is contradictory. According to some Indo-Europeanists, the root is to be reconstructed with full-grade throughout (**weyt'-*), while others maintain that the root had reduced-grade (**wit'-*) throughout, and still others (Szemerényi, Rix, and Beekes, for example) maintain that there was an intraparadigmatic ablaut variation (**weyt'- ~ *wit'-* [traditional reconstruction **u̯eu̯id- ~ *u̯id-*]). Sihler favors the second alternative, namely, **wit'-* throughout.

The suffix **-meno-/*-mno-* was used to form middle participles in Late Proto-Indo-European (cf. Szemerényi 1996:320—321; Meier-Brügger 2003:186; Fortson 2010:108; Meillet 1964:279; Sihler 1995:618; Adrados 1995.II:741; Beekes 2011:279—280; Rix 1992:236): cf. Greek φερό-μενο-ς 'carrying'; Sanskrit *bhára-māṇa-ḥ* 'carrying'; Avestan *barəmna-* 'carrying'. Related forms may have existed in Anatolian (cf. Szemerényi 1996:320—321): cf. the Luwian participle (nom. sg.) *ki-i-ša-am-m[i-iš]* 'combed' (n. *ki-ša-am-ma-an*) (cf. Laroche 1959:55), assuming here that graphemic *-mm-* either represents or is derived from *-mn-*.

In Late Proto-Indo-European, the suffixes **-tʰo-* and **-no-* were used to form verbal adjectives. Both later developed into past participle markers in the individual non-Anatolian daughter languages (cf. Meillet 1964:277; Meier-Brügger 2003:186 — but see Drinka 2009). The suffix **-tʰo-* was the more widespread of the pair. It was originally accented and attached to the reduced-grade of the root: **kʰlu-tʰó-s* 'famous, renowned' (cf. Sanskrit *śru-tá-ḥ* 'heard'; Greek κλυτός 'heard'; Latin *inclutus* 'famous, celebrated, renowned'; Old Irish [noun] *cloth* 'fame'). The same patterning may be observed in **-no-*: **pʰl̥H-nó-s* 'full' (cf. Sanskrit *pūrṇá-ḥ* 'full, filled'; Old Irish *lán* 'full'; Lithuanian *pìlnas* 'full'). For details, cf. Adrados 1975.II:740—745; Beekes 2011:279; Burrow 1973:370—371; Fortson 2010:109; Schmitt-Brandt 1998:268—269; Sihler 1995:621—625 and 628; Szemerényi 1996: 323—324. Occasionally, other suffixes were used to form past participles as well in the individual daughter languages: cf. Sanskrit *chid-rá-ḥ* 'torn apart' (with **-ró-*), *pak-vá-ḥ* 'cooked' (with **-wó-*), etc. These, too, were originally verbal adjectives.

19.19. CONCLUDING REMARKS

In this chapter, we have discussed traditional views concerning the reconstruction of the Proto-Indo-European morphological system, though only the most important characteristics have been examined. We have seen that it is possible to discern at least two distinct chronological stages of development, which may simply be called "Early Proto-Indo-European" and "Late Proto-Indo-European". Early Proto-Indo-European may be defined as the stage of development existing before the separation of the Anatolian branch from the main speech community, while Late Proto-Indo-European may be defined as the stage of development existing after the Anatolian languages had split off and before the emergence of the individual non-Anatolian daughter languages. Even though a fundamental assumption underlying this division is that there were common developments in the non-Anatolian daughter

languages that set them apart as a group from Hittite and the other Anatolian languages, it must be emphasized that much that appeared later was already incipient in Early Proto-Indo-European.

As a result of the preceding analysis, it is clear that the Late Proto-Indo-European morphological system not only contained the remnants of earlier successive periods of development, it also included a substantial number of new formations (cf. Lehmann 1993:185) — Kerns—Schwartz (1972) refer to these new formations as "neologisms". In many cases, we have been able to trace how and when these new formations came into being. It is even possible to discern different stages within Late Proto-Indo-European, though, for our purposes, it is not necessary to define all of these stages. Moreover, we have also caught glimpses of how the inherited morphological system was modified in the individual daughter languages, though the study of these changes falls outside of the scope of this book, and individual descriptive and comparative grammars should be consulted for more information. These works are listed in Volume 4 of this book.

It may be noted that Drinka (1995:4) reaches many of the same conclusions arrived at in this chapter — specifically, she states:

1. It is incorrect to project all of the morphological complexity of Sanskrit and Greek into Proto-Indo-European. There is no sign of much of this complexity outside the eastern area.
2. The simplicity of the Hittite morphological system represents archaism, to a large extent, not loss.
3. The distribution of morphological features across the Indo-European languages cannot be accounted for by positing a unified proto-language, or even a proto-language which was dialectally diverse on a single synchronic level. Rather, it must be admitted that Indo-European was not a single entity in space or time, that Indo-European languages developed from different chronological levels, that is, that they had different "points of departure" from a dynamic proto-conglomerate.

Similar views are expressed by, among others, Adrados (1992), Lehmann (2002), Shields (2004:175), Watkins (1962:105), and Polomé (1982b:53), who notes:

> …the wealth of forms, tenses, and moods that characterize Greek and Sanskrit, and in which an earlier generation saw prototypes of exemplary Indo-European grammatical structure in the verbal system, is nothing by a recent common development of this subgroup of languages.

Drinka (1995:4) further remarks that, among the non-Anatolian daughter languages, Germanic is particularly archaic (likewise Polomé 1972:45: "The particularly conservative character of Gmc. has long been recognized…"), and the same may be said about Tocharian (cf. Jasanoff 2003).

APPENDIX: THE ORIGIN OF THE VERBAL THEMATIC STEMS

Beyond mentioning that verbal thematic stems were mostly later, post-Anatolian developments, nothing has been said in the previous sections of this chapter about their possible origin. In this Appendix, we will briefly explore how they may have come into being. We will begin by listing the verbal thematic paradigm as traditionally reconstructed (cf. Fortson 2004:89 and 2010:98):

Primary

	Singular	Plural
1	**bʰér-o-H₂*	**bʰér-o-me(s)*
2	**bʰér-e-si*	**bʰér-e-tʰe*
3	**bʰér-e-tʰi*	**bʰér-o-ntʰi*

Secondary

	Singular	Plural
1	**bʰér-o-m*	**bʰér-o-me*
2	**bʰér-e-s*	**bʰér-e-tʰe*
3	**bʰér-e-tʰ*	**bʰér-o-ntʰ*

Fortson (2004:89 and 2010:98) mentions that the first person singular ending was "ultimately the same as the 1st singular ending of the middle (**-h_2e*), and it is widely believed that the thematic conjugation had its origins in the middle." It is more likely, however, that the middle, the thematic conjugation, and the perfect of traditional Indo-European grammar all ultimately developed from a common source, namely, the undifferentiated stative of Early Proto-Indo-European (cf. Jasanoff 2003:144—145). As shown by Jasanoff (2003), this was also the source of the Hittite *ḫi*-conjugation.

As noted by Jasanoff (2003:70, 97, 148—149, and 224—227), the starting point for the development of the verbal thematic forms must have been the stative third person singular. In accordance with Jasanoff's views, I assume that, just as the third person ending **-tʰ* was added to athematic/active stems, replacing the earlier athematic/active ending **-s*, it was also added to the third person in stative stems: (athematic/active) **bʰér+tʰ* (earlier **bʰér-s*), (stative) **bʰér-e+tʰ* (earlier **bʰér-e*). Significantly, the ending **-e* was retained here instead of being replaced, as in the case of the athematic/active stems. From there, the pattern was analogically extended to the rest of the paradigm, thus producing a new stem type, the so-called "thematic" stems. The stem was then reinterpreted as **bʰér-e/o-*, and the position of the accent was fixed on the root throughout the paradigm. It should be noted here that there may also have existed a second type of thematic formation in which the root was in reduced-grade and the accent was fixed on the thematic vowel throughout the paradigm (cf. Fortson 2004:89 and 2010:98) — this is the *tudáti* or

sixth class of Sanskrit grammar (cf. Burrow 1973:329—330). However, this is often considered to be a post-Proto-Indo-European formation (cf. Watkins 1969:63). For the most part, the personal endings were taken over from the athematic/active conjugation (cf. Jasanoff 2003:149), though the stative ending was retained in the first person singular primary: *$b^hér$-o-H_2 (< *$b^hér$-o+H_2e). Fortson (2004:89 and 2010:98) further observes: “The theme vowel was in the *o*-grade before the 1st person endings and the 3rd plural, i.e. before endings beginning with a resonant or laryngeal; the reason for this is not known”. For additional information on the origin of thematic stems, cf. Watkins 1969:59—68.

CHAPTER TWENTY

PROTO-INDO-EUROPEAN MORPHOLOGY II: PREHISTORIC DEVELOPMENT

20.1. INTRODUCTION

In the preceding chapter, we discussed traditional views on the reconstruction of the Proto-Indo-European morphological system. Two main periods of development were identified:

1. Early Proto-Indo-European
2. Late Proto-Indo-European

Early Proto-Indo-European was defined as the stage of development existing just before the separation of the Anatolian branch from the main speech community, while Late Proto-Indo-European was defined as the stage of development existing between the separation of the Anatolian languages and the appearance of the individual non-Anatolian Indo-European daughter languages. The time period covered was approximately 5000—3000 BCE (these are the dates given by Lehmann 2002:2 for the traditional reconstruction of Proto-Indo-European).

In the Appendix accompanying Chapter 4 of this book, an attempt was made to identify the main stages of development that the Proto-Indo-European phonological system passed through between the time that it became separated from the other Nostratic daughter languages and the appearance of the non-Anatolian Indo-European daughter languages. Four main periods of development were identified:

1. Pre-Proto-Indo-European
2. Phonemic Stress Stage of Proto-Indo-European
3. Phonemic Pitch Stage of Proto-Indo-European
4. Disintegrating Indo-European

At this point, it would be helpful to correlate the morphological stages of development with the phonological stages. Clearly, Late Proto-Indo-European is equivalent to Disintegrating Indo-European, while Early Proto-Indo-European may be correlated with the Phonemic Pitch Stage of Proto-Indo-European. It was at the end of the Phonemic Pitch Stage of development that the Anatolian languages became separated from the main speech community.

The question now naturally arises as to what the Proto-Indo-European morphological system may have been like during still earlier stages of development. In this chapter, we will attempt to answer that question. In so doing, we will discuss both the Phonemic Pitch Stage and the Phonemic Stress Stage in order to get a more

comprehensive picture of the prehistoric development of the Proto-Indo-European morphological system. The time period covered in this chapter is roughly 7000—5000 BCE. Lehmann (2002:3) uses the term "Pre-Indo-European" to designate this period and (2002:v and 245) dates it to between 8000—5000 BCE. I prefer a more narrow time period and reserve the term "Pre-Proto-Indo-European" for earlier than 7000 BCE.

There have been several serious efforts to ascertain the salient characteristics of the earliest form of the Proto-Indo-European morphological system. Until fairly recently, it was common to think in terms of ergativity (cf. Lehmann 2002:4). In ergative languages, the subjects of intransitive verbs and the direct objects of transitive verbs are treated identically for grammatical purposes, while subjects of transitive verbs are treated differently (cf. Trask 1993:92—93; Crystal 2003:165—165; Comrie 1979:329—394; see Dixon 1994 for a book-length treatment of ergativity). This is what Kenneth Shields proposes, for example, in a number of stimulating works. Beekes (1995:193—194) may be mentioned as another who suggests that Proto-Indo-European may once have had an ergative-type system. However, the majority of Indo-Europeanists no longer consider ergativity to have been a characteristic feature of the Proto-Indo-European morphological system at any stage in its development. Rather, there is a growing recognition that the earliest morphological system of Proto-Indo-European that can be recovered was most likely characterized by an active structure. In active languages, subjects of both transitive and intransitive verbs, when they are agents semantically, are treated identically for grammatical purposes, while non-agent subjects and direct objects are treated differently (cf. Trask 1993:5—6). An "agent" may be defined as the entity responsible for a particular action or the entity perceived to be the cause of an action (cf. Trask 1993:11; Crystal 1992:11 and 2003:16). In her 1992 book, *Linguistic Diversity in Space and Time*, Johanna Nichols discusses many of the distinguishing characteristics of active (and stative-active) languages. We will have more to say about these characteristics later (§20.3 below). Proponents of this view include Lehmann (1974, 1989b, 1995, and 2002), Barðdal—Eythórsson (2009), B. Bauer (2000), Drinka (1999), Gamkrelidze—Ivanov (1984 and 1995), Neu (1976), Oettinger (1976), Piccini (2008), Pooth (2004 and 2018b), K. H. Schmidt (1980), and R. Stempel (1998), among others. The treatment in this chapter is adapted from Lehmann's 2002 book *Pre-Indo-European*. See also Matasović to appear and Esser 2009. For theoretical background, see Donohue—Wichmann (eds.) 2008.

20.2. NOTES ON PHONOLOGY

As noted above, in the Appendix accompanying Chapter 4, The Reconstruction of the Proto-Indo-European Phonological System, an attempt was made to identify the main stages of development that the Proto-Indo-European phonological system passed through between the time that it became separated from the other Nostratic daughter languages and the appearance of the non-Anatolian Indo-European daughter languages. We shall begin by repeating some of what was discussed there.

Pre-Proto-Indo-European was followed by the Phonemic Stress Stage of Proto-Indo-European, which is the earliest stage of Proto-Indo-European proper that can be recovered. This stage was characterized by the phonemicization of a strong stress accent that caused the reduction and elimination of the vowels of unaccented syllables — that is to say that the phonemicization of a strong stress accent was responsible for the development of quantitative vowel gradation (quantitative ablaut). This change was the first in a long series of changes that brought about the grammaticalization of what began as a purely phonological alternation, and which resulted in a major restructuring of the earlier, Pre-Proto-Indo-European vocalic patterning. This restructuring of the vowel system was a continuous process, which maintained vitality throughout the long, slowly-evolving prehistory of the Indo-European parent language itself and even into the early stages of some of the daughter languages.

It was during the Phonemic Stress Stage of Proto-Indo-European that the syllabic resonants came into being. Lengthened-grade vowels may also have first appeared during this stage of development.

In the latest period of Proto-Indo-European (what I call "Disintegrating Indo-European"), quantitative ablaut was no longer a productive process. Had there been a strong stress accent at this time, each Proto-Indo-European word could have had only one syllable with full-grade vowel, the vowels of the unstressed syllables having all been eliminated. (As an aside, it may be noted that this is the type of patterning reconstructed for Proto-Kartvelian — see Chapter 6 of this book for details.) However, since the majority of reconstructed Proto-Indo-European words have more than one full-grade vowel, the stress accent must have become non-distinctive at some point prior to the latest stage of development.

In the Phonemic Pitch Stage of Proto-Indo-European, pitch accent replaced stress accent, and the accent lost its ability to weaken or eliminate the vowels of unaccented syllables, that is to say, Proto-Indo-European changed from a "stress-accent" language to a "pitch-accent" language. Here, the basic rule was that morphologically significant syllables were marked by high pitch, while morphologically nonsignificant syllables were marked by low pitch.

The phonological system of the Phonemic Pitch Stage of Proto-Indo-European may be reconstructed as follows (this is the system used in this chapter):

Obstruents:	p^h	t^h	k^h	k^{wh}	(voiceless aspirated)
	b	d	g	g^w	(plain voiced)
	(p')	t'	k'	k'^w	(glottalized)
		s			
Laryngeals:	ʔ	h	ħ͡h ʕ͡ɦ	ħ͡h^w	
Nasals and Liquids:	m/m̥	n/n̥	l/l̥	r/r̥	
Glides:	w(/u)	y(/i)			

Vowels:	e	o	a	i	u	ə
	ē	ō	ā	ī	ū	

Notes:
1. The high vowels **i* and **u* had the non-phonemic low variants **e* and **o* respectively when contiguous with *a*-coloring laryngeals (**h*, **h͡h* and **ʕ͡ħ*), while the vowel **e* was lowered and colored to **a* in the same environment.
2. Apophonic *o* had not yet developed. It arose later in Disintegrating Indo-European from apophonic *a*. However, already during this stage, and even earlier, in the Phonemic Stress Stage of Proto-Indo-European and in Pre-Proto-Indo-European, there was a non-apophonic *o* that had been inherited from Proto-Nostratic.
3. The velar stops developed non-phonemic palatalized allophones when contiguous with front vowels and **y*.
4. There were no voiced aspirates at this time. They developed later in Disintegrating Indo-European from earlier plain voiced stops.

Phonemic analysis:

A. Obstruents: always non-syllabic.
B. Resonants (glides, nasals, and liquids): syllabicity determined by surroundings: the resonants were syllabic when between two non-syllabics and non-syllabic when either preceded or followed by a vowel.
C. Vowels: always syllabic.

Suprasegmentals:

A. Stress: non-distinctive.
B. Pitch: distribution morphologically conditioned: high pitch was applied to morphologically-distinctive vowels, while low pitch was applied to morphologically-non-distinctive vowels.

During the Phonemic Pitch Stage of development, the system of vowel gradation assumed the following form:

	Lengthened-Grade	Normal-Grade	Reduced-Grade	Zero-Grade
A.	ē ~ ā	e ~ a	ə	Ø
B.	ēy ~ āy	ey ~ ay	i, əyV	y
	ēw ~ āw	ew ~ aw	u, əwV	w
	ēm ~ ām	em ~ am	m̥, əmV	m
	ēn ~ ān	en ~ an	n̥, ənV	n
	ēl ~ āl	el ~ al	l̥, əlV	l
	ēr ~ ār	er ~ ar	r̥, ərV	r

C.	Ae [Aa] ~ Aa	Aə	A
D.	Aey [Aay]	Ai, AəyV	Ay
	Aew [Aaw]	Au, AəwV	Aw

Note: The symbol **ə* is used here to indicate the reduced-grade vowel corresponding to normal-grade **e* and **a*. This is the so-called "schwa secundum" of traditional Indo-European grammar. It is usually written *ъ.

20.3. ACTIVE STRUCTURE

Before discussing the prehistoric development of Proto-Indo-European morphology, it would be helpful to give some background information concerning active-type languages. A great deal of theoretical information on this topic was previously given at the beginning of Chapter 17. Here, we will begin by quoting in full Dixon's (1994:71—78) description of Split-S systems (that is, active structure or active-type languages), then repeat Klimov's list of typical features of active-type languages from Chapter 17, and end with Lehmann's description and interpretation of those features from his 2002 book *Pre-Indo-European*.

Dixon notes (cover symbols: A = subject of transitive; O = direct object; S = subject of intransitive):

> The identifications between S, A and O in accusative and ergative systems can be shown graphically as in Figures 4.1 and 4.2. In Figure 4.3 we show the system in a split-S language. Intransitive verbs are divided into two sets, one with S_a (S marked like A) and another with S_o (S marked like O).
>
> For the Siouan Mandan, Kennard (1936) distinguishes verbs which indicate an 'activity' from those which indicate a 'state or condition'. The first class (of 'active verbs') can be transitive, occurring with subjective and objective pronominal suffixes (e.g. 'ignore', 'tell', 'give', 'see', 'name'), or intransitive, occurring just with subjective suffixes (e.g. 'break camp', 'enter', 'arrive', 'think over', 'go'). The second class (of 'neutral verbs') takes only the objective prefixes, they include 'fall', 'be lost', 'lose balance' and verbs covering concepts that would be included in an adjectival class for other languages such as 'be alive', 'be brave' and 'be strong'. One might prefer to say that S_a (intransitive 'active') verbs refer to an activity that is likely to be controlled, which S_o ('neutral') verbs refer to a non-controlled activity or state.

Types of split system

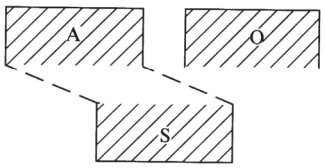


Figure 4.1: Accusative System

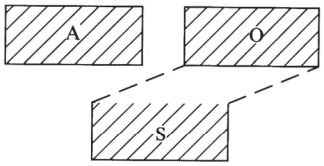


Figure 4.2: Ergative System

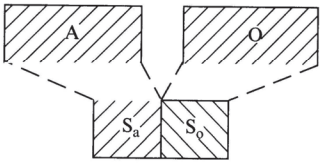


Figure 4.3: Split-S System

Note that in a split-S language like Mandan each intransitive verb has fixed class membership — either S_a or S_o — generally on the basis of its prototypical meaning. If one wanted to use a verb which deals with a prototypically non-controlled activity to describe that activity done purposely, then it would still take S_o marking (and something like an adverb 'purposely' could be added). And similarly for a verb which describes a prototypically controlled activity used to refer to that activity taking place accidentally — S_a marking would still be used (according to the prototypical pattern) together with something like an adverb 'accidentally'.

Guaraní, a Tupí-Guaraní language from Paraguay, provides a further example of split-S marking. Gregores and Suárez (1967) distinguish three classes of verb. 'Transitive verbs' (e.g. 'give', 'steal', 'know', 'order', 'suspect', 'like') take prefixes from both subject and object paradigms (i.e. A and O). 'Intransitive verbs' ('go', 'remain', 'continue', 'follow', 'fall') take subject prefixes (i.e. S_a). Both of these classes can occur in imperative inflection, unlike the third class, which Gregores and Suárez call 'quality verbs'; these take prefixes (S_o) which are almost identical to object prefixes on transitive verbs. Most quality verbs would correspond to adjectives in other languages, although the class does contain 'remember', 'forget', 'tell a lie' and 'weep'.

Split-S languages are reported from many parts of the world — they include Cocho, from the Popolocan branch of Oto-Manuean (Mock 1979), Ikan, from the Chibchan family (Frank 1990), many modern languages from the Arawak family and quite possible Proto-Arawak (Alexandra Y. Aikhenvald, personal communication), many Central Malayo-Polynesian languages of eastern Indonesia (Charles E. Grimes, personal communication), and problably also the language isolate Ket from Siberia (Comrie 1982b). The most frequently quoted example of a split-S language is undoubtedly Dakota, another member of the Siouan family (Boas and Deloria 1939; Van Valin 1977; Legendre and Rood 1992; see also Sapir 1917; Fillmore 1968: 54). There are many other languages of this type among the (possibly related) Caddoan, Souan and Iroquoian families, e.g. Ioway-Oto (Whitman 1947) and Onondaga (Chafe 1970).

Mithun (1991a) provides a detailed and perceptive study of the semantic basis of the S_a/S_o distinction in Lakhota (a dialect of Dakota), Caddo (from the Caddoan family) and Mohawk (from the Iroquoian family) — prototypical S_a (like A) 'perform, effect, instigate and control events', while prototypical S_o (like O) are 'affected; things happen or have happened to them' (Mithun 1991a: 538). She also reconstructs the ways in which semantic parameters underlying the S_a/S_o distinction may have shifted over time.

The essential function of a language is to convey meaning; grammar exists to code meaning. The great majority of grammatical distinctions in any language have a semantic basis. But there are always a few exceptions. As a language develops many factors interrelate — phonological changes which can lead to grammatical neutralization; loans and other contact phenomena — and can lead to temporary loss of parallelism between grammar and meaning. Mithun (1991a: 514) mentions that the Guaraní verb *avuří* 'to be bored' is S_a when we would expect it to be S_o from its meaning. But this is a loan from the Spanish verb *aburrir* (*se*) and Guaraní has a convention of borrowing Spanish intransitive verbs as S_a items and Spanish adjectives as S_o verbs. Note that there is a native Guaraní verb *kaigwá* 'to be or become bored' which is in the S_o class.

There are split-S language where the two intransitive classes do not have as good a semantic fit as those in Mandan and Guaraní. Thus in Hidatsa, another Siouan language (Robinett 1955), the S_a class includes volitional items like 'talk', 'follow', 'run', 'bathe' and 'sing', but also 'die', 'forget' and 'have hiccups', which are surely not subject to control. And the S_o class includes 'stand up', 'roll over' and 'dress up', in addition to such clearly non-volitional verbs as 'yawn', 'err', 'cry', fall down' and 'menstruate'.

One must of course allow for cultural differences. As mentioned in §3.3, in some societies vomiting plays a social role and is habitually induced, while in other societies it is generally involuntary; the verb 'vomit' is most likely to be S_a in the first instance and S_o in the second. In some societies and religions people believe that they can to an extent control whether and when they die, so the verb 'die' may well be S_a. But even when taking such factors into account, there is seldom (or never) a full grammatical-semantic isomorphism. The S_a/S_o division of intransitive verbs in a split-S language always has a firm semantic basis but there are generally some 'exceptions' (with the number and nature of the exceptions varying from language to language). As Harrison (1986: 419) says of Guajajara, a split-S language from the Tupí-Guaraní family, 'semantically, a few verbs seem to be in the wrong set'.

The size of the S_a and S_o classes varies a good deal. Merlan (1985) quotes examples of languages with a small closed S_o class and a large open S_a class (e.g. Arikara from the Caddoan family) and with a small closed S_a class and a large open S_o class (e.g. Dakota). In other languages both classes are open (e.g. Guaraní).

In some split-S languages the distinction between S_a and S_o extends far beyond morphological marking. Rice (1991) shows how, in the Northern Athapaskan language Slave, causatives can be based on S_o (her 'unaccusative') but not on S_a (her 'unergative'); passive on S_a but not on S_o; noun incorporation can involve O and S_o, but not S_a; and so on.

It might be thought that a split-S language could be described without recourse to an S category, that instead of what I posit as the universal set of syntactic primitives, S, A and O, we should use four primaries for a split-S language: S_a, S_o, A and O. Or perhaps just two, A and O, with the proviso that a transitive clause involves A and O and that there are two kinds of intransitive clause, one with just A and the other with just O.

Careful study of the grammars of split-S languages shows that they do work in terms of a unitary S category with this being subdivided, for certain grammatical purposes, into S_a and S_o. Many languages from the Tupí-Guaraní family have, in main clauses, prefix set 1 cross-referencing A or S_a, and prefix set 2 referring to O or S_o. But in subordinate clauses set 2 is used for O and for all S (i.e. both S_o and S_a). (Jensen 1990; see §4.5 below). Seki (1990) lists a number of other ways in which S_a and S_o are grouped together by the grammar of Kamaiurá, a Tupí-Guaraní language. Wichita, a Caddoan language, has a split-S system with one class of intransitive verbs (e.g. 'go') taking the same prefix as A in a transitive clause, and a second class (including verbs such as 'be cold' and 'be hungry') taking the same prefix as transitive O. Rood (1971) notes two grammatical processes that group together O and S (and take no account at all of the distinction between S_a and S_o): many O or S (but no A) NPs can optionally be incorporated into a verb word, and a single set of verbal affixes indicates plural O or S (another set is used for plural A). Finally, S and A behave the same way in constituent ordering: and O NP (if there is one) will generally precede the verb, and then the subject (A or S NP) can either precede or follow this complex.

Split-S marking relates to the nature of the verb. It is scarcely surprising that for most languages of this type morphological marking is achieved by cross-referencing on the verb (as it is for all languages mentioned above). There are, however, some split-S languages which have syntactic function shown by case markings on an NP, e.g. Laz from the South Caucasian family (Holisky 1991).

Yawa, a Papuan language from Irian Jaya, combines NP marking and cross-referencing. A pronominal-type postposition, inflecting for person and number, occurs at the end of an NP in A function, whereas S and O are marked by prefixes to the verb. This is a split-S language in that S_o intransitive verbs take the same prefix as marks O in a transitive verb, whereas S_a have a prefix that is plainly a reduced form of the postposition on NPs in A function. Singular forms are (dual and plural follow the same pattern):

	A postposition	S_a prefix	O/S_o prefix
1sg.	*syo*	*sy-*	*in-*
2sg.	*no*	*n-*	*n-*
3sg. masc.	*po*	*p-*	*Ø*
3sg. fem.	*mo*	*m-*	*r-*

It will be seen that although intransitive verbs divide into an S_o class (which is closed, with about a dozen members, e.g. 'to be sad', 'to remember', 'to yawn') and an S_a class (which is open and includes 'walk' and 'cry'), Yawa does work in terms of the S category — there is always a prefix indicating S (rather than S_a being marked by a postposition, as A is). (Data from Jones 1986.)

There are also examples of a split-S system where syntactic functions are marked by constituent order. Tolai, an Austronesian language spoken in New Britain, Papua New Guinea, has, in transitive clauses, the A NP before the verb and the O NP following it. Intransitive clauses have a single core NP — this must precede the verb for one set of verbs (e.g. 'go', 'sit', 'say', 'eat', 'be sick', 'be cold') and must follow the verb for another set (e.g. 'flow', 'fall', 'burn', 'cry', 'grow', 'be big', 'be nice'). We thus have a contrast between S_a and S_o realized through constituent order. (Data from Mosel 1984.)

A very similar pattern is apparent in Waurá, an Arawak language spoken on the Upper Xingu River in Brazil. Here a transitive clause shows basic constituent order AVO; the verb has a pronominal prefix cross-referencing the A NP, as in (1). There are two classes of intransitive verbs. One (which includes 'work', 'flee', 'walk', 'fly') has an S_a NP that precedes the verb, and there is a verb prefix cross-referencing it, as in (2). The other (which includes 'catch fire', 'die', 'be full', 'be born' and 'explode') has an S_o NP that comes after the verb. This is illustrated in (3).

(1) *yanumaka ɨnuka p-itsupalu*
jaguar 3sg + kill 2sgPOSS-daughter
the jaguar killed your daughter

(2) *wekɨ́hɨ katumala-pai*
owner 3sg + work-STATIVE
the owner worked

(3) *usitya ikítsii*
catch fire thatch
the thatch caught fire

Thus, S_a behaves exactly like A, and S_o like O. (A full discussion is in Richards 1977; see also Derbyshire 1986: 493—5.)

In conclusion, we can note that some scholars maintain there to be three basic types of system for marking syntactic function: accusative, ergative and split-S (often called 'active' or by a variety of other names — see, for example, Dahlstrom 1983; Klimov 1973). Mithun (1991a: 542), for example, insists that split-S systems are 'not hybrids of accusative and ergative systems'. Despite such scholarly opinions, it is a clear fact that split-S systems do involve a mixture of ergative and accusative patterns — S_a is marked like A and differently from O (the criterion for accusativity) while S_o is marked like O and differently from A (the criterion for ergativity). I would fully agree with Mithun that split-S systems 'constitute coherent, semantically motivated grammatical systems in themselves'. So do other kinds of split-ergative grammars, e.g. those to be described in §4.2 which involve a split determined by the semantic nature of NPs. The fact that a grammatical system is split does not imply any lack of coherency or stability or semantic basis. There are two simple patterns of syntactic identification, accusative and ergative, and many combinations of these, as exemplified throughout this chapter. The various

ways of combining ergative and accusative features can all yield systems that are grammatically coherent and semantically sophisticated.

The one difficulty we do have is what 'case names' to use for A and O in a split-S language. Since each of A and O is like S for some intransitive verbs and unlike S for others the names nominative/accusative and absolutive/ergative are equally applicable — to choose one of these sets over the other would be unmotivated. Using ergative for A and accusative for O is one possibility, although one might also want to take into consideration the relative markedness between A-marking and O-marking in each particular language. One solution is not to employ any of ergative, absolutive, accusative or nominative for a split-S language but just stick to the terms A-marking and O-marking.

According to Klimov, the typical features of active-type languages are as follows:

Lexical properties:

1. Binary division of nouns into active vs. inactive (often termed *animate* and *inanimate* or the like in the literature).
2. Binary division of verbs into active and inactive.
3. Classificatory verbs or the like (classification based on shape, animacy, etc.).
4. Active verbs require active nouns as subject.
5. Singular-plural lexical suppletion in verbs.
6. The category of number absent or weakly developed.
7. No copula.
8. "Adjectives" are actually intransitive verbs.
9. Inclusive/exclusive pronoun distinction in first person.
10. No infinitive, no verbal nouns.
11. Etymological identity of many body-part and plant-part terms (e.g., "ear" = "leaf").
12. Doublet verbs, suppletive for animacy of actant.

Syntactic properties:

13. The clause is structurally dominated by the verb.
14. "Affective" (inverse) sentence construction with verbs of perception, etc.
15. Syntactic categories of nearer or farther object rather than direct or indirect object.
16. No *verba habiendi*.
17. Word order usually SOV.
18. Direct object incorporation into verb.

Morphological properties:

19. The verb is much more richly inflected than the noun.
20. Two series of personal affixes on the verb: active and inactive.
21. Verbs have aspect or Aktionsarten rather than tense.

22. The noun has possessive affixes.
23. Alienable-inalienable possession distinction.
24. Inalienable possessive affixes and inactive verbal affixes are similar or identical.
25. Third person often has zero affix.
26. No voice opposition (since there is no transitivity opposition). Instead, there can be an opposition of what is called *version* in Kartvelian studies (roughly active vs. middle in the terminology of Benveniste 1966, or an opposition of normal valence vs. valence augmented by a second or indirect object, or an opposition of speech-act participant vs. non-participant in indirect-object marking on the verb).
27. Active verbs have more morphological variation or make more morphological distinctions than inactive verbs.
28. The morphological category of number is absent or weakly developed.
29. There are no noun cases for core grammatical relations (no nominative, accusative, genitive, dative). Sometimes there is an active/inactive case opposition.
30. Postpositions are often lacking or underdeveloped in these languages. Some of them have adpositions inflected like nouns.

Lehmann's (2002:59—60) description of the salient morphological characteristics of active languages is as follows:

> The inflections of active/animate nouns and verbs differ characteristically from those of the stative/inanimate counterparts in active languages. Active nouns have more inflected forms than do statives. Moreover, there are fewer inflected forms in the plural than in the singular…
>
> Similarly, stative verbs have fewer inflections than do the active…
>
> As another characteristic verbal inflections express aspect, not tense, in active languages…
>
> Stative verbs are often comparable in meaning to adjectives…
>
> Active languages are also characteristic in distinguishing between inalienable and alienable reference in personal pronouns…
>
> Moreover, possessive and reflexive pronouns are often absent in active languages…

A little earlier, Lehmann (2002:4—5) discusses the importance of the lexicon:

> As a fundamental characteristic of active languages, the lexicon must be regarded as primary. It consists of three classes: nouns, verbs and particles. Nouns and verbs are either animate/active or inanimate/stative. Sentences are constructed on the basis of agreement between the agent/subject and the verb; they are primarily made up of either active nouns paired with active verbs or of stative nouns paired with stative verbs. Particles may be included in sentences to indicate relationships among nouns and verbs. In keeping with active structure, the lexical items are autonomous. Although Meillet did not refer to active languages, he recognized such autonomy in the proto-language, adding that "the word … suffices of itself to indicate its sense and its role in discourse" (1937:356).

> In accordance with this structure, two nouns and two verbs may be present in the lexicon for objects and actions that may be regarded on the one hand as being active or on the other hand as representing a state. Among such phenomena is fire, which may be flaring and accordingly viewed as active or animate, as expressed by Sanskrit *Agnís* and Latin *ignis*, which are masculine in gender, or as simply glowing and inactive, as expressed by Hittite *pahhur*, Greek *pûr* [πῦρ], which are neuter in gender. Similarly, the action lying may be regarded as active, i.e. 'to lie down', as expressed by Greek *légō* [λέγω] 'lay, lull to sleep' (cf. Pokorny 1959:658—59) or as stative, as expressed by Greek *keîtai* [κεῖται], Sanskrit *śéte* 'is lying' (cf. Pokorny 1959:539—40). Through their inflection and some of their uses, such lexical items may be recognized in the texts; but by the time of the dialects the earlier distinctions may have been lost. As Pokorny says of reflexes of **legh*-, it was punctual originally but its reflexes subsequently became durative. Other verbs as well as nouns were modified so that specific active or stative meanings of their reflexes were no longer central in the dialects.
>
> As a further characteristic, there is relatively little inflection, especially for the stative words. Inactive or stative verbs were inflected only for the singular and third plural. This restriction is of especial interest because it permits us to account for one of the features of the Indo-European perfect. As will be discussed further below, the perfect has been recognized as a reflex of the Pre-Indo-European stative conjugation. In this way, its stative meaning as well as the inclusion of characteristic forms only for the singular and the third plural find their explanation.

Additional information is given by Lehmann in §2.7 of his book (2002:29—32):

> As noted above, the lexicon consists of three parts of speech: nouns, verbs, particles. There are two classes of nouns: active or animate and stative or inanimate. Active nouns may have referents in the animal and plant world; for example, a word may mean 'leaf' as well as 'ear', cf. Sanskrit *jambha*- 'tooth' versus Greek *gómphos* [γόμφος] 'bolt, pin'. Adjectives are rare, if attested; many of those in Government languages correspond to stative verbs in active languages. Verbs, like nouns, belong to one of two classes: they are either active/animate or stative/inanimate. Members of the active verb class are often associated with voluntary action.
>
> Active languages have no passive voice. Verbs may have, however, a semantic feature known as version. That is, action may be directed centripetally towards a person, or centrifugally away from the person. As an example, the root **nem*- has reflexes in some dialects with the meaning 'take' as in German *nehmen*, but in others with the meaning 'give, distribute' as in Greek *némō* [νέμω]. Like the two words for some nouns that were given above, only one of the meanings is generally maintained in a given dialect. Version is subsequently replaced by voice, in which the centripetal meaning is expressed by the middle, as in Greek *daneízesthai* [δανείζεσθαι] 'borrow' as opposed to *daneízein* [δανείζειν] 'lend'. Gamkrelidze and Ivanov relate with version the presence of alienable possessive pronouns having centrifugal value in contrast with inalienable pronouns having centripetal value (1995:291).

Active languages include a third set of verbs that have been labeled involuntary; their ending is that of the third person singular, and they have no overt subject (Lehmann 1991). Some of these refer to the weather, such as Latin *pluit* 'it is raining', others to psychological states, such as Latin *paenitet (me)* 'I am sorry'. As the dialects become accusative, these require subjects, as in their English counterparts.

Lacking transitivity, active languages have no verb for 'have'. Instead, the relationship between a possessor and the possessed is expressed by use of a case corresponding to the dative or locative accompanied by the substantive verb, as in the Latin construction illustrated by *mihi est liber* '[to me is the book] I have a book'. Reflexes of this situation are apparent in many of the early Indo-European languages. As they adopt accusative characteristics, however, the languages tend to lose impersonal constructions; to replace them they adapt finite verbs, such as Greek *ékhein* [ἔχειν], Latin *habēre* and English *have* (cf. Lehmann 1993:221—23; Justus 1999; Bauer 2000:186—88).

Syntactically, active languages are generally OV. They construct sentences by usually pairing active nouns with active verbs, and conversely stative nouns with stative verbs. Not related to the verb through transitivity, these elements may be referred to as complements (Comp). The nominal element closest to the verb corresponds to a direct object in Government languages through its complementation of the meaning expressed by the verb, while the more remote nominal element corresponds to an adverbial nominal expression. Active verbs may be associated with two complements, in the order: Subject — Comp-2 — Comp-1 — Verb. Stative verbs do not take Comp-1.

Morphologically, there is little inflection of nouns and verbs, especially of the stative classes. The plural has fewer forms than does the singular. The stative class of nouns may be subdivided into groups according to the shape of their referent; for example, the active class may be divided into groups by persons as opposed to animals. Verbs have richer inflection than do nouns, although that for stative verbs is not as great as that for active verbs. The inflectional system of verbs expresses aspect, rather than tense.

There is no passive. Instead, active verbs may express centrifugal as well as centripetal meaning, such as produce versus grow in accordance with version. We have illustrated its effect by citing the two meanings of reflexes of **nem-*.

In somewhat the same way, possession may be expressed differently for alienable and inalienable items, like *his shirt* (centrifugal) vs. *his hand* (centripetal). In keeping with such reference, pronouns may differ for exclusive and inclusive groupings, as illustrated by the old story about the missionary who used the exclusive pronoun in saying: "We are all sinners," to the satisfaction of his native audience. These oppositions in active verbs and nominal relationships are in accord with the opposition between active (alienable, exclusive) and stative (inalienable, inclusive) reference.

Finally, particles play a major role in indicating sentential and inter-sentential relationships.

Much as the basic force of stativity in active languages may be associated with the expression of inalienability and exclusivity, transitivity as a major force in Government languages affects not only the relationship between verbs and nouns but also that between adpositions and nouns. A major shift between

> Pre-Indo-European and Proto-Indo-European involved the introduction of transivity with gradual replacement of stativity. The shift in the verb system was recognized by Szemerényi at the conclusion of his 'Introduction,' but he did not associate the earlier system with active language structure (1996:326—38). The recognition of active language structure will help us in accounting for more residues than he did, also in the nominal and particle system.

Finally, Lehmann (2002:52—53) makes an important distinction between "agreement languages" and "government languages". He notes:

> [In agreement languages, s]entences are bound by agreement rather than government. Agreement between agent and verb is carried out by usually pairing an active noun with an active verb, and similarly by pairing stative nouns and verbs.
>
> As we have stated above (Chapter 2.7), these fundamental differences distinguish two basic language types: Agreement and Government. Each has two sub-types: in Agreement languages these are class and active/stative, generally referred to as active; in Government languages these are ergative and nominative/accusative, referred to by either label, of which I use accusative.

For more information on split-S languages, see Donohue—Wichmann (eds.) 2008.

20.4. EVIDENCE INDICATIVE OF EARLIER ACTIVE STRUCTURE

By use of the Comparative Method, the regular morphological patterning of the Indo-European parent language can be reconstructed. Ever so often, items and patterns are identified that do not fit the regular morphological patterning. These items and patterns may be archaisms left over from earlier stages of development, in which case, they are called "residues" (also known as "irregular forms", "anomalous forms", "exceptions", "survivals", or "relic forms"). The identification and analysis of these residues can provide important clues about these earlier stages. Lehmann (2002:47—63) begins his investigation by looking for such residues.

Lehmann (2002:51) notes that one of the first to suggest that Proto-Indo-European may have belonged to a different type during an earlier stage of development was Christianus Cornelius Uhlenbeck, though Oleksandr Popov, in a series of articles published between 1879 and 1881, was probably the first (cf. Danylenko 2016). In a short article published in 1901, Uhlenbeck proposed that the distinction between the (masculine) nominative and the (masculine) accusative cases may originally have been between agent and patient. Though not properly a residue, this interpretation would fit well with an active-type structure.

Lehmann (2002:53—61) examines, in turn: (A) the Proto-Indo-European lexicon for patterning indicative of earlier active structure; (B) reflexes in nouns, verbs, and particles that point to earlier active structure; (C) syntactic patterns in the early dialects that may be interpreted as reflecting an earlier active structure; and (D) morphological patterns indicative of an earlier active structure.

A. LEXICON: In active languages, nouns and verbs fall into two large groups: active/animate and stative/inanimate. Lehmann emphasizes that the classification by speakers of nouns into one of these groups may not coincide with what may seem "logical". For instance, trees and plants, moving natural items (such as the sun, moon, smoke, etc.), animals, and exterior body parts (such as legs and hands) are typically classified as active/animate in the Indo-European daughter languages, while internal body parts (such as heart and liver), stationary natural items (such mountain peaks and cliffs), and grains and fruits are typically classified as inanimate. Lehmann (2002:66—74) cites, among others, Latin (f.) *manus* 'hand' and (m.) *pēs* 'foot' as examples of external body parts, Latin (n.) *cor* 'heart' and (n.) *iecur* 'liver' as examples of internal body parts, Latin (f.) *mālus* 'apple tree', (f.) *ornus* 'ash', (m.) *quercus* 'oak', and (m.) *flōs* 'flower' as examples of trees and plants, Latin (n.) *mālum* 'apple', (n.) *hordeum* 'barley', (n.) *fār* 'spelt', and (n.) *milium* 'millet' as examples of fruits and grains, Latin (m.) *sōl* 'sun' and (m.) *fūmus* 'smoke' as examples of moving natural items, Latin (f.) *avis* 'bird' as an example of animal, and Hittite (n.) *ḫé-kur* 'mountain peak' and (n.) *te-kán* 'earth' (cf. J. Friedrich 1991:68 and 220) as examples of stationary natural items. All of these and other such examples may be counted as residues of an earlier active structure.

Lehmann also cites examples of doublets from the individual daughter languages for common words like 'fire' (= 'flaming, burning') (as in Latin *ignis* 'fire, flame') vs. 'fire' (= 'glowing') (as in Hittite *pa-aḫ-ḫur* 'fire' and Greek πῦρ 'fire'), 'thunderbolt' (as in Sanskrit *vájra-ḥ* 'thunderbolt [= Indra's weapon]' and Avestan *vazra-* 'club, mace') vs. 'lightning' (as in Gothic *lauhmuni* 'lightning' and New High German *Blitz* 'lightning'), 'to sustain, to nourish' (as in Latin *alō* 'to nourish, to support' and Old Irish *alim* 'to nourish') vs. 'to grow' (as in Gothic *alan* 'to grow'). The first forms are active/animate, while the second forms are inactive/inanimate. These doublets can be seen as residues of an earlier active structure. Such doublets are also noted by Gamkrelidze—Ivanov (1995.I:238—239).

B. NOUNS, VERBS, AND PARTICLES: Lehmann points out that the gender of nouns in the individual Indo-European daughter languages indicate whether particular objects (persons or things) were viewed by speakers as active/animate or inactive/inanimate. For instance, in Latin, tree names are masculine or feminine (= active/animate), while names for grains or fruits are neuter (= inactive/inanimate) (see above for examples). Lehmann concludes that active/animate nouns became masculine or feminine, whereas inactive/inanimate nouns became neuter when the earlier classification was replaced by the threefold gender classification (masculine ~ feminine ~ neuter) found in Late Proto-Indo-European and the early dialects. As noted in the previous chapter, Hittite represents a stage of development in which the feminine gender had not yet appeared (cf. Luraghi 1997:7; Lehmann 1993:150). Hittite nouns inherently fall into one of two gender classes, usually referred to as "common" and "neuter".

Common gender corresponds to masculine and feminine in the non-Anatolian Indo-European daughter languages. Though common nouns can be both inanimate and animate, neuter nouns are almost always inanimate. Luraghi (1997:7) prefers to call them "inactive", inasmuch as neuter nouns cannot be utilized as the subject of action verbs. Thus, Hittite provides direct evidence for an earlier, two gender system (cf. Lehmann 2002:66) comparable to what is found in active languages. Residues of this earlier system are also preserved here and there in other daughter languages (Lehmann cites kinship terms as examples).

In like manner, verbs associated with actions (Lehmann cites Latin *ferō* 'to bear, to bring, to carry' and *fodiō* 'to dig, to excavate' as examples) show active inflection in the individual daughter languages, while verbs associated with states (such as Latin *sequor* 'to follow') show middle/passive inflection, the former of which reflect an earlier active pattern, and the latter, an earlier stative pattern. Moreover, verbs referring to natural events (such as Latin *tonat* '[it is] thundering', *fulget* '[it is] lightning', *pluit* '[it is] raining, *ningit* '[it is] snowing') or psychological states (such as Latin *me piget* 'it disgusts me', *me pudet* 'I am ashamed', *eos paenitebat* 'they were sorry', *me miseret* 'I pity', *eum taedet* 'he is disgusted') are typically rendered in the third person singular in the daughter languages. In the Indo-European parent language, active and stative conjugations were distinguished by a special set of endings (these are discussed in detail in the preceding chapter). The stative developed into the perfect in the non-Anatolian Indo-European daughter languages (cf. Lehmann 2002:78—80); it also served as the basis for the middle (cf. Lehmann 2002:80—81). This patterning is in full agreement with what occurs in active languages.

Lehmann (2002:83) points out that the verb 'to have' was lacking in Proto-Indo-European. Possession was expressed by constructions such as Latin *mihi est* 'it is to me' [= 'it is mine, I own it']. Each of the daughter languages has introduced various means to indicate possession. Active languages lack the verb 'to have' (cf. Klimov 1977).

Finally, Lehmann discusses the use of particles in the daughter languages. Particles include what are commonly designated adverbs, adpositions (prepositions and postpositions), conjunctions, etc. (cf. Lehmann 2002:86). In particular, he discusses how the Proto-Indo-European particle *$*b^hi$* served as the basis for the instrumental/dative/ablative dual and plural case endings in Sanskrit. In a lengthy section, Lehmann (2002:87—99) lists and analyzes the particles traditionally reconstructed for Proto-Indo-European. Importantly, he notes that the demonstrative pronouns of traditional comparative grammar can be traced back to earlier anaphoric and deictic particles. Lehmann convincingly demonstrates that the class of particles is comparable to those found in active languages.

C. SYNTACTIC PATTERNS: Lehmann begins by describing the syntactic patterns typically found in active languages. He notes that active verbs are associated

with active/animate nouns as agents and also with "complements". Word order is typically (S)OV. The complement closest to an active verb may be compared to objects in accusative languages — it indicates the recipient, goal, or beneficiary of the action (that is, the "patient"). If another complement is included in the sentence, it has adverbial value. Thus, the patterning for sentences with active verbs is: Subject + Adverbial Expression + Object + Verb. Inasmuch as stative verbs generally have a stative noun as patient, the patterning for sentences with stative verbs is: Subject (= Patient) + Adverbial Expression + Verb. Lehmann then goes on to cite examples from Hittite and Homeric Greek that appear to maintain the earlier word order patterning.

Later, in Chapter 5, Lehmann devotes considerable attention to the important role that participles play in the early Indo-European daughter languages and compares their use with similar constructions in several non-Indo-European languages to support his contention that basic Proto-Indo-European word order was OV. He concludes (2002:112):

> As illustrated above, in the early dialects non-finite forms supplement the principal clause in numerous ways, comparable to dependent clauses though with relationships that are less specifically indicated. Klimov described the use of non-finite constructions in the East Caucasian languages similarly. According to him "the use of participial and gerundial verb forms that take the place of predicates of subordinate clauses corresponds to the use of subordinate clauses in Indo-European languages. Relative pronouns and conjunctions are only rarely used in the East Caucasian languages; there are also indications that some conjunctions in these languages developed only later from various verbal and nominal forms" (1969:53). The East Caucasian languages then provide comparable syntactic evidence on the uses of non-finite forms in OV languages as do Japanese and Turkish among other verb-final languages. In this way they support reconstruction of the sentence structure proposed above for Pre-Indo-European, with its general use of participial and other non-finite elements instead of subordinate clauses.

Lehmann (2002:114—124) examines the evidence for subordinate clauses in Proto-Indo-European in great detail. He reaches the conclusion that subordinate clauses, whether relative or adverbial, probably did not exist either in early Proto-Indo-European or in Pre-Indo-European but, rather, were introduced later, especially in the early dialects themselves.

Lehmann (2002:132—133) sums up his views on early Proto-Indo-European and Pre-Indo-European syntax as follows:

> The earliest Greek texts, as by Homer, are similarly simple in syntax, as are those in the other early dialects. We may posit such syntax for Pre-Indo-European as well as for Proto-Indo-European. Many sentences consist of simple clauses. Particles may suggest a relationship between them, but only in the later dialects do these and other forms function as conjunctions that indicate subordinate clauses. Such clauses came to be

further distinguished from principal clauses by verb forms such as the subjunctive and optative. Complex sentences were supported by the introduction of writing as demonstrated in Greek, Latin and other dialects with continuous textural tradition. The earliest texts before writing was introduced in any given dialect were basically paratactic, as were those of Proto-Indo-European and Pre-Indo-European.

D. MORPHOLOGICAL PATTERNS: In active languages, stative nouns and verbs typically have fewer inflectional forms than active nouns and verbs. In the preceding chapter, we saw that this was also the case in Proto-Indo-European, especially in the earlier, Pre-Anatolian period of development ("Early Proto-Indo-European"), where, for example, the stative conjugation lacked forms for the first and second persons plural. Forms for these persons were added later — they were borrowed from the active conjugation in order to fill out the paradigm. Lehmann mentions this example as well and also mentions that the lack of differentiation between nominative and accusative in neuter nouns is a reflex of the earlier patterning. He then notes that verbs are marked for aspect rather than tense in active languages and that the present is used to indicate activity, while the so-called "perfect" is used to indicate state in the early dialects. The situation in the early dialects is actually more complicated here than what Lehmann makes it out to be, but, as a generalization, his point still stands. Lehmann continues by discussing the position of adjectives. He claims that adjectives did not exist as a separate class in the period he calls "Pre-Indo-European" but were later developments. To support his claim, he takes note of the fact that a recent study of Germanic adjectives found few cognates in other Indo-European daughter languages, and he mentions that no common Proto-Indo-European forms can be securely reconstructed for comparative and superlative on the basis of what is found in even the earliest attested dialects, though there is evidence that a restricted set of formations were beginning to be reserved for these functions in at least some of the dialects. Finally, Lehmann tries to find evidence for inalienable and alienable reference in personal pronouns, and he asserts that the great variety of forms for possessive and reflexive pronouns found in the individual daughter languages points to them being later formations, which did not exist in Proto-Indo-European. Lehmann observes that possessive and reflexive pronouns are often absent in active languages, thus providing another piece of evidence in corroboration of his views.

In his investigation, Lehmann convincingly shows that there is abundant evidence from the lexicon, from nouns, verbs, and particles, from syntactic patterns, and from morphological patterns pointing to an earlier stage of development in which the Indo-European parent language exhibited many of the characteristics typical of active languages. Lehmann then devotes separate chapters to elaborating on each of these points: Chapter 4: Lexical Structure (pp. 64—99), Chapter 5: Syntax (pp. 100—133), Chapter 6: Derivational Morphology (pp. 134—166), and Chapter 7:

Inflectional Morphology (pp. 167—193). Material from these chapters has been incorporated into the above discussion. In what follows, we will focus on the formation of nouns, the declension of nouns, pronouns, and verb morphology.

20.5. ROOT STRUCTURE PATTERNING

We have dealt with root structure patterning in detail in the preceding chapter. Here we will only be concerned with summarizing the most ancient patterning.

The phonemicization of a strong stress accent during the Phonemic Stress Stage of Proto-Indo-European disrupted the inherited root structure patterning. The positioning of the stress was morphologically distinctive, serving as a means to differentiate grammatical relationships. All vowels were retained when stressed but were either weakened (= "reduced-grade") or totally eliminated altogether (= "zero-grade") when unstressed: the choice between the reduced-grade versus the zero-grade depended upon the position of the unstressed syllable relative to the stressed syllable as well as upon the laws of syllabicity in effect at that time. During the Phonemic Stress Stage of development, the basic rule was that only one full-grade vowel could occur in any polymorphemic form. Finally, it was at the end of this stage of development that the syllabic allophones of the resonants came into being.

Roots were monosyllabic and consisted of the root vowel between two consonants (cf. Benveniste 1935:170; Lehmann 2002:141): **CVC*-. Unextended roots could be used as stems (also called "bases" or "themes") by themselves (when used as nominal stems, they are known as "root nouns"), that is to say that they could function as words in the full sense of the term (cf. Burrow 1973:118; Lehmann 2002:142), or they could be further extended by means of suffixes.

The stress-conditioned ablaut alternations gave rise to two distinct forms of extended stems:

Type 1: Root in full-grade and accented, suffix in zero-grade: *CV́C-C-.
Type 2: Root in zero-grade, suffix in full-grade and accented: *CC-V́C-.

When used as a verb stem, Type 1 could undergo no further extension. However, Type 2 could be further extended by another suffix on the pattern **CC-V́C-C*-, or *-*n*- could be infixed after the root and before the suffix on the pattern **CC-n-V́C*- (cf. Lehmann 1952:17—18 and 2002:142). Examples of these alternating patterns are given in the preceding chapter and need not be repeated here. Further addition of a determinative or suffixes pointed to a nominal stem (cf. Benveniste 1935:171; Lehmann 1952:17). In keeping with the rule that only one full-grade vowel could occur in any polymorphemic form, when a full-grade suffix was added to any stem, whether unextended or extended, the preceding full-grade vowel was replaced by either reduced-grade or zero-grade. We should note that this rule was no longer in effect in the Phonemic Pitch Stage of Proto-Indo-European. During the Phonemic Pitch Stage, many of these reduced-grade or zero-grade vowels were analogically replaced by full-grade vowels. Fortunately, enough traces of the earlier system

remain in the early dialects, especially Sanskrit, that it is possible to reconstruct the original patterning.

20.6. THE FORMATION OF NOUNS

Disintegrating Indo-European distinguished a great many derivational suffixes, and these are described in detail in the traditional comparative grammars of Brugmann—Delbrück, Hirt, and Meillet, among others. By far, the most common types were those ending in the thematic vowel *-*e/o*-, which could be added either directly to the undifferentiated root or to the root extended by one or more suffixes. The majority of these suffixes were not ancient, and it is possible to trace how the system was built up over time. It is clear, for example, that the thematic suffixes proliferated during the Disintegrating Indo-European period at the expense of other types (cf. Burrow 1973:122; Lehmann 2002:143) — thematic stems were rare in Hittite (cf. Sturtevant 1951:79, §114; Burrow 1973:120).

In the chapter on Proto-Nostratic morphology, we discussed the root structure patterning of the Nostratic parent language. Roots had the shape **CVC*-. We saw that a stem could either be identical with a root or it could consist of a root plus a single derivational morpheme added as a suffix to the root: **CVC*+*C*-. Any consonant could serve as a suffix. This was the patterning inherited by Pre-Proto-Indo-European, which means that the earliest suffixes predate the appearance of Proto-Indo-European proper as a distinct language. This is an important point.

It is not possible to discern any distinction in meaning or function in the suffixes that were inherited by Proto-Indo-European from Proto-Nostratic. However, the newer suffixes that arose within Proto-Indo-European proper were most likely assigned specific meanings or functions. During the course of its development, Proto-Indo-European continued to create new lexical items, with the result that the original meaning or function of suffixes that had been created in Proto-Indo-European at earlier stages were mostly obscured by later developments. By the time the Disintegrating Indo-European period had been reached, the number of productive suffixes in use had grown considerably.

During both the Phonemic Stress Stage and the Phonemic Pitch Stage of Proto-Indo-European, accentuation played a prominent role in nominal derivation, as noted by Burrow (1973:119—120):

> The most important distinction in nominal derivation in early Indo-European was not between the different suffixes simple or compound, but in a difference of accentuation according to which a word formed with the same suffix functioned either as an action noun or agent noun/adjective. Accented on the root it was an action noun and neuter, accented on the suffix it was an agent noun or adjective and originally of the co-called ‘common gender’. The system is preserved to some extent in Sanskrit and is exemplified by such doublets as *bráhma* n. ‘prayer’ : *brahmā́* m. ‘priest’, *yáśas* n. ‘glory’ : *yaśás*- m. ‘glorious’. The Sanskrit examples are not very numerous, and are only found in the case of a small number of suffixes; they are in fact the last remnants of a system

> dying out. In earlier Indo-European on the other hand the system was of very great extension and importance, and it is fundamental to the understanding not only of the formation of nouns but also of their declension.

According to Burrow, the rules governing the position of the accent may be stated as follows:

1. Neuter action nouns were accented on the stem in the so-called "strong" cases but on the ending in the so-called "weak" cases (cf. Burrow 1973:220—226).
2. Common gender agent noun/adjectives were accented on the suffix throughout the paradigm (cf. Burrow 1973:119).
3. Athematic verbs were accented on the stem in the singular but on the ending in the plural (and, later, in the dual as well) in the indicative but on the ending throughout the middle (cf. Burrow 1973:303).

This fairly simple system was replaced by a more elaborate one during the Disintegrating Proto-Indo-European period. For Disintegrating Proto-Indo-European, Fortson (2004:107—110 and 2010:119—122) recognizes four distinct types of athematic stems, determined by the position of the accent as well as the position of the full-grade (or lengthened-grade) vowel (Fortson notes that additional types developed in individual daughter languages) (see also Watkins 1998:61—62; Beekes 1985:1 and 1995:174—176):

1. Acrostatic: fixed accent on the stem throughout the paradigm, but with ablaut changes between the strong and weak cases.
2. Proterokinetic (or proterodynamic): the stem is accented and in full-grade vowel in the strong cases, but both accent and full-grade vowel are shifted to the suffix in the weak cases.
3. Amphikinetic (or holokinetic or amphidynamic): the stem is accented in the strong cases, while the case ending is accented in the weak cases. Typically, the suffix is characterized by a lengthened *o*-grade vowel in the nominative singular and a short *o*-grade vowel in the accusative singular.
4. Hysterokinetic (or hysterodynamic): the suffix is accented in the strong cases, and the case ending in the weak cases.

Szemerényi (1996:162) adds a fifth type:

5. Mesostatic: the accent is on the suffix throughout the paradigm.

The thematic formations require special comment. It seems that thematic agent noun/adjectives were originally accented on the ending in the strong cases and on the stem in the weak cases. This pattern is the exact opposite of what is found in the neuter action nouns. The original form of the nominative singular consisted of the accented thematic vowel alone, **-é/ó*. It is this ending that is still found in the vocative singular in the daughter languages and in relic forms such as the word for

the number 'five', **pʰenkʷʰe* (**peŋqᵘe* in Brugmann's transcription [cf. Sanskrit *páñca*, Greek πέντε]), perhaps for earlier **pʰn̥kʷʰé*. The nominative singular in **-os* is a later formation and has the same origin as the genitive singular (cf. Szemerényi 1972a:156).

Benveniste (1935:174—187) devotes considerable attention to describing the origin of the most ancient nominal formations. He begins by identifying the basic principles of nominal derivation, thus: An adjective such as Sanskrit *pṛthú-* 'broad, wide, large, great, numerous' is based upon a root **pʰel-* 'to stretch, to extend', suffixed by the laryngeal **H* (Benveniste writes **-ə-*) found in Hittite *pal-ḫi-iš* 'broad'. Adding the suffix **-tʰ-* to the root yields two alternating stem types: type 1: **pʰél-tʰ-*, type 2: **pʰl-étʰ-* (Benveniste writes **pél-t-* and **pl-ét-* respectively). Next, the laryngeal determinative **-H₂-* (Benveniste writes **-ə₂-*) is added to type 2, followed by **-ú-* (Benveniste writes *-éu-*). The addition of the accented **-ú-* results in the loss of the stem vowel: **pʰl̥tʰH₂ú-* (Benveniste writes **pl̥tə₂éu-*) (> Sanskrit *pṛthú-ḥ* 'broad, wide, large, great, numerous', Greek πλατύς 'wide, broad'). Benveniste then goes on to illustrate these principles with further examples.

Next, according to Benveniste, two fundamental types of nominal formations can be established on the basis of the two alternating stem types mentioned above. The first is built upon type 1. These are often characterized by a long vowel, though normal-grade is also found (where they are different, the transcriptions used in this book are given first, followed by those used by Benveniste in parentheses):

TYPE 1 (**CV́C-C-*):

t'er-w-* (der-w-*) > **t'ŏ́rw-* (**dŏ́rw-*)	(cf. Greek δόρυ 'tree; [wooden] plank or beam'; Hittite **ta-ru* 'wood'; Sanskrit *dā́ru-* 'piece of wood, wood, wooden implement')
k'en-w-* (gen-w-*) > **k'ĕ́nw-* (**gĕ́nw-*)	(cf. Greek γόνυ 'knee' [*o*-grade]; Hittite *gi-e-nu* 'knee'; Sanskrit *jā́nu-* 'knee')
Héy-w-* (ə₂éi-w-*) > **Hēyw-* (**ə₂ēiw-*)	(cf. Sanskrit *á́yu-* 'vital power, life force')
sén-w-* > **sēnw-* (sōnw-*)	(cf. Sanskrit *sā́nu* 'summit, top')
pʰél-w-* (pél-w-*) > **pʰelw-* (**pelw-*)	(cf. Gothic *filu* 'much'; Greek *πόλυ 'much, many' [*o*-grade])
tʰér-w-* (tér-w-*) > **tʰerw-* (**terw-*)	(cf. Greek [Hesychius] τέρυ·)
pʰékʰ-w-* (pék-w-*) > **pʰekʰw-* (**pekw-*)	(cf. Sanskrit *páśu* 'domestic animal'; Latin *pecu* 'sheep, flock')

Note: The apophonic **ŏ́* reconstructed above developed from earlier apophonic **ắ*. Thus, **t'ŏ́rw-* (**dŏ́rw-*) < **t'ắrw-*, **sōnw-* < **sānw-*, etc.

TYPE 2 (*CC-$\acute{V}C$-):

*t'r-éw- (*dr-éu-)	>	*t'r-w-és (*dr-w-és)	(cf. Greek [gen.] δρυός)
		*t'r-w-én- (*dr-w-én)	(cf. Avestan *drvan-*)
*k^hr-éw- (*kr-éu-)	>	*k^hr-w-ér- (*kr-w-ér-)	(cf. Greek κρυερός 'icy, chilling')
		*k^hr-w-én- (*kr-w-én-)	(cf. Latin *cruen-tus* 'bloody')
		*k^hr-w-és (*kr-w-és)	(cf. Greek *κρυός 'icy cold, frost')
*k'r-éw- (*gr-éu-)	>	*k'r-w-és (*ǵr-w-és)	(cf. Avestan [gen. sg.] *zrū* = *zrvō*)
		*k'r-w-én- (*ǵr-w-én-)	(cf. Avestan *zrvan-* 'time')
*b^hr-éw- (*bhr-éu-)	>	*b^hr-w-én- (*bhr-w-én-)	(cf. Sanskrit *bhurván-* 'restless motion [of water]')
*p^hk^h-ét^h- (*pk-ét-)	>	*p^hk^h-t^h-én- (*pk-t-én-)	(cf. Greek κτείς 'a comb')
*k^hr-ét'- (*kr-éd-)	>	*$k^h\underset{\circ}{r}$-t'-éy- (*kr-d-éi-)	(cf. Lithuanian *širdìs* 'heart' [*-ir-* < *-$\underset{\circ}{r}$-])
*Hw-ét'- (*əw-éd-)	>	*Hu-t'-én- (*əu-d-én-)	(cf. Sanskrit *udán-* 'water')
		*Hu-t'-ér- (*əu-d-ér-)	(cf. Greek ὕδωρ 'water')
*k^hr-ét^h- (*kr-ét-)	>	*$k^h\underset{\circ}{r}$-t^h-ér- (*$k\underset{\circ}{r}$-t-ér-)	(cf. Greek κρατερ-ός 'strong, stout, mighty')
		$k^h\underset{\circ}{r}$-t-^{h}és ($k\underset{\circ}{r}$-t-és)	(cf. Greek κράτος 'strength, might')

Note: The voiced aspirates reconstructed above (*b^hr-éw-, etc.) did not appear until the Disintegrating Indo-European stage of development. The voiced aspirates developed from earlier plain (that is, unaspirated) voiced stops. I follow Gamkrelidze—Ivanov (1995.I:12—15) in reinterpreting the plain voiceless stops traditionally reconstructed for Proto-Indo-European as voiceless aspirates and the plain voiced stops as glottalics (ejectives).

Benveniste goes on to point out that such formations can be further extended according to the same scheme: the new suffix takes full-grade vowel, and everything preceding it passes into zero-grade (meanings are not given for forms built on those cited in the preceding charts):

*t'r-w-én- (*dr-w-én-)	>	*t'r-u-n-és (*dr-u-n-és)	(cf. Vedic [gen. sg.] *drúnaḥ*)
*b^hr-w-én- (*bhr-w-én-)	>	*b^hr-u-n-én- (*bhr-u-n-én-)	(cf. Proto-Germanic **brunan-* 'to rush' > Old Icelandic *bruna* 'to rush, to advance with great speed', etc.)
*k'r-w-én- (*ǵr-w-én-)	>	*k'r-u-n-éy (*ǵr-u-n-éi)	(cf. Avestan [dat. sg.] *zrunē*)
*Hw-t'-én- (*əu-d-én-)	>	*Hu-t'-n-és (*əu-d-n-és)	(cf. Sanskrit [gen. sg.] *udnáḥ*)

20.7. THE DECLENSION OF NOUNS

In Proto-Nostratic, relationships within a sentence were indicated by means of particles. Particles also played an important role in both Pre-Proto-Indo-European and the Phonemic Stress Stage of Proto-Indo-European. Though many relationships were still indicated by means of particles during the Phonemic Pitch Stage of Proto-Indo-European, their role was beginning to change. Particles employed with verbs were developing into conjunctions, while those used with nouns were developing into postpositions. Moreover, a more prominent role was being assigned to case forms as Proto-Indo-European was beginning to change from an active-ype language to an accusative-type language.

In the preceding chapter, the following case forms were reconstructed for the end of the Phonemic Pitch Stage of Proto-Indo-European just prior to the separation of the Anatolian branch from the main speech community:

Case	Animate	Inanimate
Singular:		
Nominative	**-s*	
Nominative-accusative		**-Ø*
Vocative	**-Ø*	
Accusative	**-m̥/-m* (or **-n̥/-n*)	
Genitive-ablative	**-es/-as/-s*	**-es/-as/-s*
Dative-Locative	**-ey/-i*	**-ey/-i*
Plural:		
Nominative-vocative	**-es*	
Nominative-accusative		(collective **-(e)H_4*)
Genitive	**-am*	**-am*

The following thematic case endings may be reconstructed for the same period:

Case	Animate	Inanimate
Singular:		
Nominative	**-a-s*	
Nominative-accusative		**-a-m*
Vocative	**-e*	
Accusative	**-a-m* (or **-a-n*)	
Genitive	**-a-s*	**-a-s*
Ablative	**-ātʰ* (< **-a-H_1(e)tʰ*)	**-ātʰ* (< **-a-H_1(e)tʰ*)
Dative-Locative	**-āy* (< **-a-ey*)/**-e/a-y*	**-āy* (< **-a-ey*)/ **-e/a-y*

Plural:		
Nominative-vocative	*-*ās* (< *-*a-es*)	
Nominative-accusative		*-*e-*H_4
Genitive	*-*ām* (< *-*a-am*)	*-*ām* (< *-*a-am*)

According to Lehmann (2002:185), three endings represent the most ancient layer and came to provide the basis for the development of the central case system; these endings are: *-*s*, *-*m*, and *-*H* (Lehmann writes *-*h*). *-*s* indicated an individual and, when used in clauses, identified the agent; *-*m* used in clauses indicated the target; and *-*H* supplied a collective meaning.

According to Gamkrelidze—Ivanov (1995.I:233—236), there were two distinct genitive formatives in the earliest form of Proto-Indo-European:

Original Oppositions

Genitive singular/plural	Genitive singular/plural
*-*os*	*-*om*

Gamkrelidze—Ivanov claim that the first formative (*-*os*) marked the genitive singular/plural on animate nouns, while the second (*-*om*) marked the genitive singular/plural on inanimate nouns. At a later date, these formatives were completely redistributed.

Gamkrelidze—Ivanov also note (1995.I:236—242) that the genitive singular ending *-*os* coincides formally with the nominative singular ending, while the genitive singular ending *-*om* coincides with the accusative singular ending. This cannot be an accident. Rather, it points to an original connection between these endings. They propose that the ending *-*os* was originally used to form semantically animate nouns, while *-*om* was used to form semantically inanimate nouns. They regard the animate class as active (that is, capable of action) and the inanimate class as inactive (that is, incapable of action). Semantically active nouns were characterized by the inactive formative *-*om* when they functioned as the target or patient of an action. Thus, for the Phonemic Stress Stage of Proto-Indo-European, the following set of formatives may be posited (replacing the **o* posited by Gamkrelidze—Ivanov with **a* to reflect the reconstructions used in this chapter):

Animate/Active Agent	Inanimate/Inactive Animate Patient
-(a)s*	*-*(a)m*

The endings *-*as* and *-*am* (Gamkrelidze—Ivanov write *-*os* and *-*om*, respectively) could also mark attributive syntactic constructions. These later gave

rise to possessive constructions (= genitive case of traditional Indo-European grammar). Specifically, Gamkrelidze—Ivanov note (1995.I:241—242):

> The endings *-*os* and *-*om* were not only markers of the active and inactive noun classes; the nature of their functions enabled them to mark attributive syntactic constructions that later gave rise to possessive constructions. Where the modifying noun (the possessor) in such a syntagma belonged to the active class, the syntagma was marked with *-*os* regardless of the class of the head (possessed) noun; and when the determiner was inactive, the syntagma was marked with *-*om* regardless of the class membership of the head word (A = noun of active class, In = noun of inactive class; modifier [possessor] precedes modified [head] noun):
>
> (1) A — A-*[o]s*
> (2) A — In-*[o]s*
> (3) In — In-*[o]m*
> (4) In — A-*[o]m*
>
> Constructions types (1) and (2) give rise to appositive forms that yield compounds such as Skt. *rāja-putra-* 'son of king', *mānuṣa-rākṣasa-* 'man-demon', i.e. 'demon in human form', Gk. *iatró-mantis* [ἰᾱτρό-μαντις] 'doctor-soothsayer', Ger. *Werwolf* 'werewolf', 'man-wolf' (Thumb and Hauschild 1959:II, §661, 401).
>
> On the other hand, constructions type (2) and (4), where inactive nouns had the ending *-*os* and active nouns had *-*om* provide the source for a separate case form which subsequently developed (in Indo-European proper) into a distinct genitive, both determining and possessive. As dictated by the modifying word in the construction, the ending *-*os*, identical to the active class marker *-*os*, becomes the genitive marker of the inactive class, while the ending *-*om*, identical to the inactive class marker *-*om* and the structural-syntactic inactive with two-place predicates, becomes the genitive markers with both attributive and possessive functions, on respectively inactive and active nouns. This account of the origin and development of *-*om* genitive explains its formal identity to the ending *-*om* which marked the structural syntactic inactive and subsequently developed into the accusative case.

Types (1) and (4) later led to a separate class of adjectives (Gamkrelidze—Ivanov 1995.I:242—244). As noted by Lehmann (2002:187—188), stative verbs largely filled the role of adjectives in early Proto-Indo-European. See also Bozzone 2016.

At the beginning of the Phonemic Pitch Stage of Proto-Indo-European, simple plural forms first started to appear in active/animate stems. They were built upon the same elements described above. According to Gamkrelidze—Ivanov (1995.I: 244), the plural of active nouns in *-*(a)s* (they write *-*s*/*-*os*) was formed by changing the ablaut grade of the ending to *-*es*. At first, there was no change to the *-*(a)m* form, though it was later extended by *-*s*, yielding the form usually reconstructed for the genitive plural in Disintegrating Indo-European: *-*(o)ms*. Later, though still within the Phonemic Pitch Stage, separate dative-locative forms came into being (cf. Gamkrelidze—Ivanov 1995.I:247—250). They were based

upon earlier adverbial particles that came to be incorporated into the case system (cf. Blažek 2014; Burrow 1973:234; Lehmann 2002:186). Thus, we arrive at the case forms reconstructed in the preceding chapter (and repeated above) for the end of the Phonemic Pitch Stage of Proto-Indo-European.

It was during the Phonemic Pitch Stage of Proto-Indo-European that the accent rules mentioned above were in effect. In light of what we have been discussing about the active structure at this stage of development, these rules should now be restated as follows:

1. Active/animate nouns were accented on the stem in the so-called "strong" cases (nominative-accusative) but on the ending in the so-called "weak" cases (dative-locative).
2. Stative/inanimate (= inactive) nouns were accented on the suffix throughout the paradigm.

The change of accent from the stem to the ending in the weak cases in active nouns may be an indication of the more recent origin of these cases. The strong cases were inherited by Proto-Indo-European from Proto-Nostratic. In Proto-Nostratic, these case markers were originally independent relational markers. The relational marker *-*ma* was used in Proto-Nostratic, as in early Proto-Indo-European, to indicate semantically inactive/inanimate nouns as well as the patient (that is, the recipient, target, or goal of an action). The dative-locative case maker also developed from a Proto-Nostratic relational marker, and there are parallels in other Nostratic daughter languages. However, it was not fully incorporated into the system of case endings until the Phonemic Pitch Stage of Proto-Indo-European. During the Phonemic Stress stage, what later became the dative-locative case ending was still an independent adverbial particle.

20.8. PRONOUNS

In the preceding chapter, the following personal pronoun stems were reconstructed for the stage of development of the Indo-European parent language immediately prior to the separation of the Anatolian languages from the main speech community (cf. Kloekhorst 2008b:112—116 for a discussion of the Anatolian developments):

Case	First Person	Second Person
Singular:		
Nominative	**ʔe+kʰ-*, **ʔe+k'-*, **ʔe+g-*	**tʰi*
Oblique/Enclitic	**me*	**tʰu*, **tʰa/e*
Plural:		
Nominative	**wey(s)*	**yuH(s)*
Oblique/Enclitic	**nas*	**was*

As both Lehmann (2002:31 and 60) and Gamkrelidze—Ivanov (1995.I:251—252) have tried to show, Proto-Indo-European probably differentiated alienable and inalienable possession at an early period of development. Gamkrelidze—Ivanov cite evidence from Hittite to support their claim. Furthermore, Gamkrelidze—Ivanov (1995.I:253—254) have tried to show that Proto-Indo-European originally differentiated inclusive and exclusive in the first person plural. They suggest that **wey*- (**wes*-) was inclusive, while **mes* was exclusive.

The demonstrative, relative, and interrogative pronoun stems traditionally reconstructed for Disintegrating Indo-European were derived from earlier deictic and anaphoric elements.

20.9. VERB MORPHOLOGY

As noted above, according to Benveniste's theories, Proto-Indo-European verb stems could either be identical with the root, in which case they had the form **CVC*-, or they could have two possible extended forms:

Type 1: Root in full-grade and accented, suffix in zero-grade: **CV́C-C*-.
Type 2: Root in zero-grade, suffix in full-grade and accented: **CC-V́C*-.

When used as a verb stem, Type 1 could undergo no further extension. However, Type 2 could be further extended by a single additional suffix on the pattern **CC-V́C-C*-, or *-*n*- could be infixed after the root and before the suffix on the pattern **CC-n-V́C*- (cf. Lehmann 1952:17—18 and 2002:142). This represents the most ancient patterning.

Furthermore, athematic verbs were accented on the stem in the singular but on the ending in the plural (and, later, in the dual as well) in the indicative but on the ending throughout the middle (cf. Burrow 1973:303). The general patterning may be represented as follows (this is what was reconstructed for "Late Proto-Indo-European" [= Disintegrating Indo-European] in the preceding chapter):

	**H*$_1$*es*- 'to be'	**H*$_1$*ey*- 'to go'	**g*^{wh}*en*- 'to slay'
Singular			
1	**H*$_1$*és-mi*	**H*$_1$*éy-mi*	**g*^{wh}*én-mi*
2	**H*$_1$*és-si*	**H*$_1$*éy-si*	**g*^{wh}*én-si*
3	**H*$_1$*és-t*^{h}*i*	**H*$_1$*éy-t*^{h}*i*	**g*^{wh}*én-t*^{h}*i*
Plural			
1	**H*$_1$*s-més*	**H*$_1$*i-més*	**g*^{wh}*n̥-més*
2	**H*$_1$*s-t*^{h}*é*	**H*$_1$*i-t*^{h}*é*	**g*^{wh}*n̥-t*^{h}*é*
3	**H*$_1$*s-ént*^{h}*i*	**H*$_1$*y-ént*^{h}*i*	**g*^{wh}*n-ónt*^{h}*i*

In thematic verbs, the accent was fixed on the stem throughout the paradigm, as follows (this is what was reconstructed for "Late Proto-Indo-European" [= Disintegrating Indo-European] in the preceding chapter):

	Primary	Secondary
Singular		
1	*$b^hér$-o-H_2	*$b^hér$-o-m
2	*$b^hér$-e-si	*$b^hér$-e-s
3	*$b^hér$-e-t^hi	*$b^hér$-e-t^h
Plural		
1	*$b^hér$-o-me(s)	*$b^hér$-o-me
2	*$b^hér$-e-t^he	*$b^hér$-e-t^he
3	*$b^hér$-o-nt^hi	*$b^hér$-o-nt^h

Though thematic stems were the most common type in the early non-Anatolian dialects, they were relatively late formations. They arose mostly in Disintegrating Indo-European, where they gradually replaced the earlier, athematic stems (cf. Lehmann 2002:160).

The athematic stems represent the most ancient layer and go back to the Phonemic Stress Stage of Proto-Indo-European. Originally, this conjugational type distinguished active verbs (cf. Lehmann 2002:171; Gamkrelidze—Ivanov 1995.I: 256—260). During the Phonemic Stress Stage of development, there was no difference between primary and secondary endings. The primary endings arose during the Phonemic Pitch Stage of Proto-Indo-European when the deictic particle *-*i* meaning 'here and now' was appended to the secondary endings. Thus, it is clear that the so-called "primary endings" are really secondary, while the so-called "secondary endings" reflect the earliest forms.

As noted in the preceding chapter, the earliest recoverable Proto-Indo-European active personal endings may have been as follows (there may also have been alternative first person endings: sg. *-*w*, pl. *-*we* — the primary evidence for these endings comes from the Anatolian branch):

Person	Singular	Plural
1	*-*m* / *-*w*	*-*me* / *-*we*
2	*-t^h	*-t^he
3	*-*s*, *-*Ø*	*-*en*

Gamkrelidze—Ivanov (1995.I:283—286), among others, note the agglutinative character of the active personal endings in Proto-Indo-European. The relationship of these endings to the personal pronoun stems is obvious.

In active verbs, the plural was distinguished from the singular by an intra-paradigmatic accent shift. In the singular, the root was accented and had full-grade,

while the endings had zero-grade. In the plural, the position of the accent was shifted to the ending, with the result that the root had zero-grade, while the endings had full-grade. This patterning has been most clearly preserved in Sanskrit, which is particularly archaic in this regard. The patterning was as follows, using the verbal root *H_1es- 'to be' for illustration:

	Singular			Plural		
1.	*H_1és+*me*	>	*H_1és-*m*	*H_1es+*mé*	>	*H_1s-*mé*
2.	*H_1és+t^he	>	*H_1és-t^h	*H_1es+t^hé	>	*H_1s-t^hé
3.	*H_1és+*e*	>	*H_1és-Ø	*H_1es+*é*	>	*H_1s-*é*

An important assumption here is that the original ending of the third person, both singular and plural, was *-*e* — the same ending found in the stative verbs. This assumption is based upon the observation that the form of the third plural found in the daughter languages is anomalous. Unlike the first and second person plural personal endings, which had the form *-*Cé*, the third plural had the form *-*éC*. The following scenario may be proposed to account for this anomaly: The third plural was formed by the addition of a deictic element *ne/a-, which is the same stem found in Hittite *na-aš* 'that'; Armenian *na 'that; he she, it; him, her'. Had *ne been added directly to the root, the expected from would have been as follows: *H_1es-+né > *H_1s-né, just like in the first and second persons plural. However, the actual form was *H_1s-én (> *H_1s-én-t^h-i, after *-t^h- and *-i- were added [cf. Sanskrit *sánti* 'they are']). This indicates that *ne was not added directly to the root but, rather, to *H_1s-é, thus: *H_1s-é+ne > *H_1s-é-n. Here, the accent was kept on the ending *-é-, and, consequently, the element *ne had zero-grade. By the way, the same patterning may be observed in the third plural of stative verbs, where *-ér is to be derived from earlier *-é-+re.

Active verbs were used with active nouns, while stative (= inactive) verbs were used with inactive nouns (cf. Gamkrelidze—Ivanov 1995.I:256). However, this only represents part of the picture. Gamkrelidze—Ivanov (1995.I:258) note that verbs used active endings in two-place constructions in which both nouns were active. They represent the paradigmatic conjugational model for verb forms with active arguments in a convenient chart (A = active noun; V = verb; In = inactive noun; superscripts show structural syntactic status):

	Agent		Predicate		Patient
1p.	A	—	V-*mi*	—	A^{In}
2p.	A	—	V-*si*	—	A^{In}
3p.	A	—	V-t^h*i*	—	A^{In}
	Person		kills		animal

They also note that there must have also been two-place constructions in which the first noun was active and the second inactive, such as in the phrase "person moves

stone". In an active language, this construction would be marked by a different verb structure than that with two active nouns. In this case, the inactive (= stative) endings would be used. Gamkrelidze—Ivanov represent this type of construction as follows:

	Agent		Predicate		Patient
1p.	A	—	V-*Ha*	—	In
2p.	A	—	V-*t^hHa*	—	In
3p.	A	—	V-*e*	—	In
	Person		moves		stone

Stative verbs (these are the so-called "perfect" stems of traditional grammar) were characterized by a special set of personal endings (originally, the first and second person plural endings were lacking — they were later borrowed from the active conjugation) (cf. Szemerényi 1996:243—244; Gamkrelidze—Ivanov 1995.I:260; Lehmann 1993:174—175 and 2002:170—171; Beekes 1995:238—239; Watkins 1998:62; Meier-Brügger 2003:180—181; Adrados 1975.II:617—621; Sihler 1995: 570—572; Rix 1992:255—257; Fortson 2010:103—104):

Person	Endings
1st sg.	*-H_2é
2nd sg.	*-t^hH_2é
3rd sg.	*-é
3rd pl.	*-ér

Unlike the active verbs, which were accented on the stem in the singular but on the ending in the plural, the stative forms were originally accented on the ending throughout the paradigm (as was the middle, which, as we saw in the preceding chapter, was derived from the stative). During the Phonemic Stress Stage of Proto-Indo-European, the stem was in zero-grade, in accordance with the rule that only one full-grade vowel could occur in any polymorphemic form. However, during the Phonemic Pitch Stage of Proto-Indo-European, the accent was shifted to the stem in the singular in imitation of the active verbs, with the result that the zero-grade was changed to full-grade. The endings remained in full-grade as well, even though they were no longer accented. The fact that the stem appeared in the *o*-grade (earlier **a*) instead of the *e*-grade indicates the secondary nature of the full-grade vowel in the singular forms. It was also during the Phonemic Pitch Stage that reduplication started to be used with stative verbs.

As Proto-Indo-European began changing from an active-type language to an accusative-type language during the Phonemic Pitch Stage of development, tense forms were introduced. At first, only two tenses were distinguished: a present/future and a preterite (= non-present). This is the situation reflected in Hittite. Additional

tenses developed in Disintegrating Indo-European. These are discussed in the preceding chapter.

The only non-finite verb form that can be securely reconstructed for the Phonemic Pitch Stage of Proto-Indo-European is the participle in *-*nt*^{h}- (cf. Lehmann 2002:183). It conveyed active meaning when added to active verbs but stative meaning when added to stative verbs. This is essentially the situation preserved in Hittite. In Disintegrating Indo-European, however, its function was modified. During the Disintegrating Indo-European period, the suffix *-*nt*^{h}- was used to form present and aorist participles in the active voice (cf. Szemerényi 1996:317—319; Meier-Brügger 2003:185; Fortson 2004:97 and 2010:108; Meillet 1964:278; Adrados 1975.II:740—741 and II:742—744; Sihler 1995:613—618; Haudry 1979:83; Beekes 1995:249—250), which is how it is used in all of the non-Anatolian daughter languages. Lehmann (2002:183) ascribes only the etyma of verbal nouns, gerunds, and the participle in *-*nt*^{h}- to what he calls "Pre-Indo-European".

As we saw in the preceding chapter, the complex verb system traditionally reconstructed for Proto-Indo-European was by no means ancient. Indeed, the complex verb system had only just started to take shape in early Disintegrating Indo-European, and its expansion was not fully completed by the time that the individual non-Anatolian daughter languages began to appear. It was left to the daughter languages to fill out and reshape the system.

In the earlier stages of development, verb morphology was rather simple. There was a binary opposition between active verbs and inactive (= stative) verbs. In general, active verbs were used with active nouns, and inactive verbs were used with inactive verbs. With the change of Proto-Indo-European from an active-type language to an accusative-type language, this earlier system was restructured, and new formations were created in accordance with the new structure.

20.10. SUMMARY: THE STAGES OF PROTO-INDO-EUROPEAN

At the beginning of this chapter, four principal stages of development were assumed for Proto-Indo-European:

1. Pre-Proto-Indo-European
2. Phonemic Stress Stage of Proto-Indo-European
3. Phonemic Pitch Stage of Proto-Indo-European
4. Disintegrating Indo-European (Lundquist—Yates 2018 refer to this stage as "Proto-Nuclear Indo-European" [PNIE])

Now that we have completed our study of the development of Proto-Indo-European from the earliest period (in this chapter) to the latest (in the preceding chapter), we are in a position to summarize our findings (this is partially adapted from Lehmann 2002:44—46, §2.10.1; see also Lehrman 2001:114—116; Tischler 1988; Georgiev 1984), beginning with the Phonemic Stress Stage:

Phonemic Stress Stage of Proto-Indo-European:

1. Phonemicization of a strong stress accent.
2. Restructuring of the inherited vowel system.
3. Reduction or loss of vowels in unaccented syllables.
4. Gradual reduction of the inherited consonant system.
5. Development of syllabic variants of the resonants (**CVRCV́* > **CəRCV́* > **CR̥CV́*).
6. Strict (S)OV word order.
7. Object-like relationships are indicated by the position of nouns immediately before the verb. The word order patterning for sentences with active verbs is: Subject + Adverbial Expression + Object + Verb; inasmuch as stative verbs generally have a stative noun as patient, the patterning for sentences with stative verbs is: Subject (= Patient) + Adverbial Expression + Verb.
8. Active-type language (with an accusative base alignment).
9. The lexicon distinguishes three fundamental stem types: verbs, nouns, particles.
10. The lexicon is flexible in expression of meaning, such as centripetal (to or towards a person) in contrast with centrifugal (away from a person).
11. Verbs and nouns are either active/animate or stative/inanimate.
12. Sentences are constructed by pairing either stative nouns with stative verbs or active nouns with active verbs, less frequently with stative verbs.
13. Stative verbs have little inflection.
14. There are no tense distinctions in verbs; aspect distinctions are dominant.
15. Active verbs are more highly inflected than stative verbs.
16. Particles play an important role.
17. Nouns have relatively little inflection, especially in the plural.
18. Adjectives are lacking as a separate class; instead stative verbs correspond to many adjectives in accusative-type languages.
19. Pronouns distinguish between alienable and inalienable possession.

Phonemic Pitch Stage of Proto-Indo-European:

1. Phonemic pitch replaces stress.
2. Continued restructuring of the vowel system.
3. Change of the inherited voiceless and voiced pharyngeal fricatives to multiply-articulated voiceless and voiced pharyngeal/laryngeal fricatives respectively (**ħ* > **ħ͡h*; **ʕ* > **ʕ͡ɦ*).
4. Velar stops develop non-phonemic palatalized allophones when contiguous with front vowels (**e̯*, **i̯*) and **y*.
5. Strict (S)OV word order.
6. Change from an active-type language to an accusative-type language begins (cf. Harris—Campbell 1995:240—281 for a discussion of various ways in which a language can shift from one type to another).
7. Subordinate clauses with participial forms are the norm rather than finite verbs preceded by principal clause.

8. There are relatively few conjunctions.
9. Case forms are still underdeveloped, though new forms are beginning to appear, some of which arise from postposed particles (cf. Blažek 2014).
10. The plural of nouns is still underdeveloped.
11. Adjectives start to appear.
12. Thematic nominal stems appear, though they are not common.
13. Heteroclitic nominal forms become common.
14. Inflection for verbs is also underdeveloped, especially for stative verbs, though new verbal forms are starting to appear.
15. So-called "primary" personal endings appear.
16. Separate middle forms arise — they are derived from the stative.
17. The verb system begins to change from representation of aspect to representation of tense; two tenses exist: a present/future and a preterite (= non-present).
18. There is only one participle, which is characterized by the suffix *-*nt*^{h}-; it conveys active meaning when added to active verbs but stative meaning when added to stative verbs.
19. Many functions of nouns and verbs are indicated by particles.
20. Particles employed with verbs are developing into conjunctions, while those used with nouns are developing into postpositions.
21. The Anatolian languages become separated from the main speech community at the end of the Phonemic Pitch Stage of the Indo-European parent language.

Disintegrating Indo-European:

1. The earlier plain voiced stops become voiced aspirates (**b*, **d*, **g* > **b*^{h}, **d*^{h}, **g*^{h}), at least in some of the dialects of Disintegrating Indo-European.
2. Apophonic *o* develops from earlier apophonic *a*.
3. First, the laryngeals **ʔ* and **h* are lost initially before vowels. In all other environments, they merge into **h*.
4. Then, the laryngeals **ḫ͡ḫ* and **ʕ͡ḥ* become **h*.
5. Finally, the single remaining laryngeal (**h*) is lost initially before vowels (except in Pre-Proto-Armenian) and medially between an immediately preceding vowel and a following non-syllabic; this latter change brings about the compensatory lengthening of preceding short vowels (**eHC*, **oHC*, **aHC*, **iHC*, **uHC* > **ēC*, **ōC*, **āC*, **īC*, **ūC*). Note: **h* may have been simply lost without a trace in certain contexts (cf. Byrd 2010).
6. In some of the dialects of Disintegrating Indo-European, the palatovelars (**k*^{yh}, **k'*^{y}, **g*^{yh}) become phonemic.
7. Word order begins to shift from (S)OV to (S)VO.
8. The characteristic sentence structure of OV languages with subordinate clauses based on participles is replaced by clauses with finite verbs that are governed by conjunctions.
9. The change to an accusative-type language is complete, though numerous relic forms from the earlier active period remain.

10. The inflection of nouns and verbs is restructured to reflect the new accusative type.
11. New case forms are created, and several declensional classes are differentiated.
12. The plural of nouns also begins to be filled out.
13. The feminine appears as a separate gender class.
14. Thematic nominal stems proliferate at the expense of other stem types.
15. Adjectives become common.
16. Personal pronouns become more widely used.
17. Rudimentary dual forms begin to appear in both nouns and verbs.
18. The change of the verb system from representation of aspect to representation of tense is completed.
19. Verb inflections are developed for use in subordinate clauses, subjunctives, and optatives.
20. Thematic verbal stems become common.
21. Aorist and imperfect verbal forms develop.
22. The function of the suffix *-*nt*^{h}- is changed — it is now used to form present and aorist participles in the active voice.
23. Separate past participle forms begin to appear; they are based upon earlier verbal adjectives.
24. Different dialect groups begin to emerge.

Recently, building especially upon the work of David Anthony and Donald Ringe (2015), there has been a growing consensus that new terminology is needed to differentiate the various stages of development of Proto-Indo-European. The term "Proto-Indo-Anatolian" has been coined to describe the period of development prior to the separation of the Anatolian branch from the rest of the Indo-European speech community. This is the stage of development that used to be called "Proto-Indo-Hittite". The next stage of development is now called "Proto-Indo-Tocharian". It represents the stage after the separation of the Anatolian branch and before the separation of Tocharian. Next, the term "Proto-Indo-European" is reserved strictly for the stage after the separation of the Tocharian branch from the rest of the speech community. This is the stage that I have called "Disintegrating Indo-European". Attempts have been made to correlate these various stages of development with genetic, onomastic, and archeological evidence and, in so doing, to refine theories regarding the most likely homeland(s) of the Indo-Europeans and their precursors, to map their migrations, and to determine possible interactions with other languages and cultures. The Maykop and Yamnaya cultures consistently figure prominently in these discussions.

20.11. CONCLUDING REMARKS

In this and the preceding chapter, the Proto-Indo-European morphological system has been systematically analyzed in order to uncover the most ancient patterning. This analysis has relied almost exclusively on Indo-European data with only

passing reference to what is found in cognate Nostratic languages. The picture that emerges, though highly plausible, is unquestionably missing important details. This is due to the fact that we are not able to recover what has been lost in earlier stages of development on the basis of an examination and analysis of the Indo-European data alone.

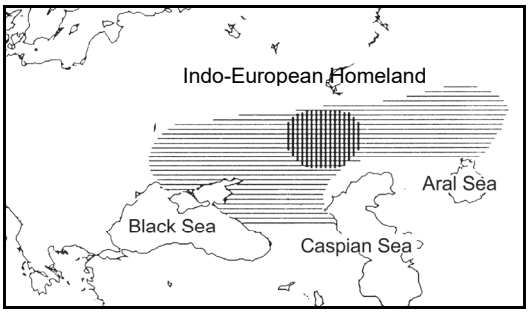
Comparison with other Nostratic daughter languages clearly indicates that a whole series of relational markers can be reconstructed for Proto-Nostratic, and at least some of these must have been inherited by Pre-Proto-Indo-European. As more work is done in reconstructing the proto-languages of the individual branches of Nostratic, future scholars will be able to arrive at a more accurate and more complete reconstruction of Proto-Nostratic. In so doing, the work done in one area will no doubt complement and further the work done in other areas so that we will be in a far better position to fill in the gaps that currently exist in our knowledge concerning the early prehistory of the individual branches themselves. Lehmann (2002:250—251), in particular, identifies the lack of adequate reconstructions for the non-Indo-European Nostratic proto-languages as a crucial problem that needs to be addressed. I could not agree more.

CHAPTER TWENTY-ONE

LANGUAGE CONTACT: INDO-EUROPEAN AND NORTHWEST CAUCASIAN

21.1. INTRODUCTION

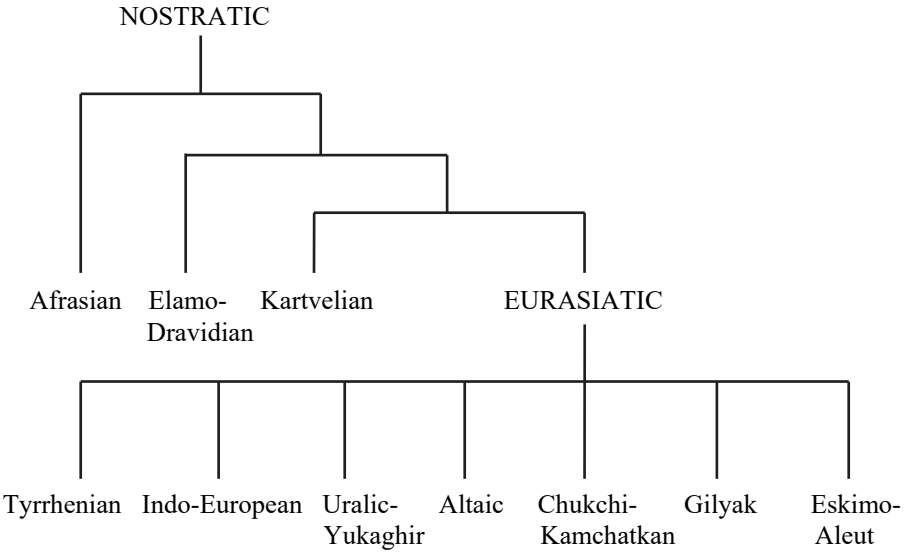
Proto-Indo-European must have come into contact with various other languages in the course of its development, and that contact must have resulted in some sort of influence (probably mutual), such as the introduction of loanwords or changes in pronunciation, morphology, and/or syntactic constructions. In Chapter 13, §13.2, I suggested that, when the Indo-Europeans arrived on the shores of the Black Sea at about 5,000 BCE, they encountered and occupied territory originally inhabited by Caucasian-speaking people, and I listed several possible shared lexical items between Proto-Indo-European and Northwest Caucasian to support this view. Of course, the people they encountered did not speak the Caucasian languages of recorded history but, rather, their ancestral language or languages. The following map (adapted from Villar 1991:15) shows the location of the Indo-Europeans at about 5,000—4,500 BCE, while the hatched area above the Caspian Sea indicates the earliest probable location of the Indo-Europeans:



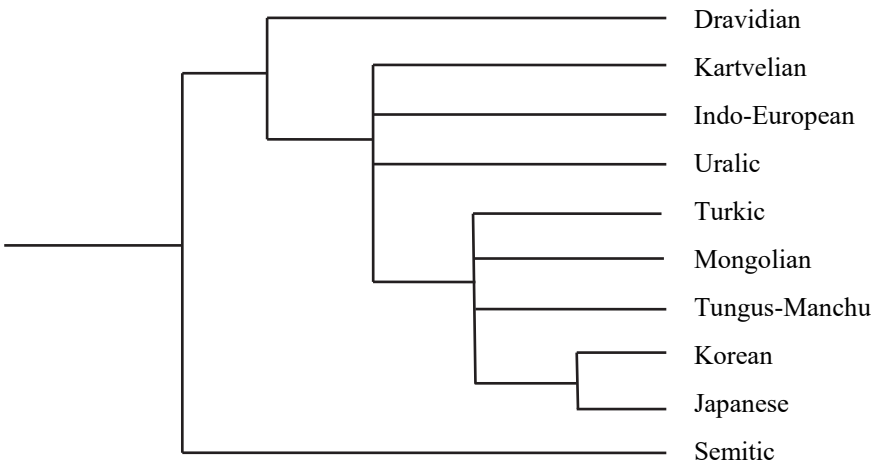
In my previous work as well as in the current book, I present a considerable amount of evidence, both morphological and lexical, for a genetic relationship between Indo-European and certain other languages/language families of northern Eurasia and the ancient Middle East, to wit, Afrasian, Elamo-Dravidian, Kartvelian, Uralic-Yukaghir, Altaic, and Eskimo-Aleut. Following Holger Pedersen (as well as Illič-Svityč and Dolgopolsky), I posit a common ancestor named "Proto-Nostratic". I also list possible cognates found in Sumerian and note that Tyrrhenian, Gilyak (Nivkh), and Chukchi-Kamchatkan are probably to be included as members of the Nostratic macrofamily as well.

Recently, several scholars have suggested that Afrasian may have been a sister language of Nostratic rather than a descendant language (see Chapter 13 for a brief

discussion of these views), while Indo-European is seen by Greenberg as being more closely related to Uralic-Yukaghir, Altaic, Gilyak, Chukchi-Kamchatkan, and Eskimo-Aleut, these forming a distinct language family called "Eurasiatic". I prefer to see Nostratic as a higher level taxonomic entity that includes Afrasian (along with Elamo-Dravidian, Kartvelian, and Eurasiatic) — my thoughts on subgrouping are presented in a chart at the end of Chapter 1 of this book, which is repeated here:



Somewhat similar views are expressed by Sergej Starostin (1999c:66) in a computer-generated Nostratic family tree (see below), though he places Kartvelian closer to Indo-European than what is indicated in my chart, and he lists Semitic as a separate branch of Nostratic — clearly, this should be Afrasian (Afroasiatic):



Now, Proto-Indo-European presents some special problems. On the one hand, its grammatical structure, especially in its earlier periods, more closely resembles those of its sister Eurasiatic languages; on the other hand, its phonological system more closely resembles the phonological systems found in Proto-Afrasian and Proto-Kartvelian, at least when using the revised Proto-Indo-European phonological system proposed by Gamkrelidze, Ivanov, and Hopper. Moreover, there are typological problems with every phonological system proposed to date for Proto-Indo-European — one wonders, for example, why there are no affricates. This leads me to suspect that Proto-Indo-European may be a blend of elements from two (or more?) different languages, as has already been suggested by several other scholars. But a blend of what? In footnote 1 of his 1992a paper, Colarusso notes that "[t]he amateur archeologist Geoffrey Bibby suggested in 1961 that PIE was a Caucasian language that went north and blended with a Finno-Ugrian tongue". This suggestion merits closer consideration. Note: Here, I am using the term "blend" to conform with Colarusso — nowadays, the term "convergence" would be used to describe this kind of language contact.

In this chapter, I would like to discuss how Colarusso's theories shed possible light on this and other issues, noting both the strong points and the limitations of his approach, and I will propose an alternative theory that I believe better fits the linguistic evidence.

Before discussing Colarusso's theories, it might be helpful to outline some of the salient characteristics of the Northwest Caucasian languages. One of the most noteworthy features of the Northwest Caucasian languages is their large consonant inventories and relatively small vowel inventories. Vowel gradation is a notable charateristic. (The phonological systems of the individual Northwest Caucasian languages are discussed in great detail by Colarusso in his 1975 Harvard University Ph.D. dissertation and by Hewitt in his 2005 *Lingua* article, "North West Caucasian".) The Northwest Caucasian languages are agglutinating languages, with ergative clause alignment. In general, nominal morphology is simple. Nouns are marked for case, number, and definiteness, but not gender (Abkhaz and Abaza/ Tapanta are exceptions). Demonstratives are characterized by three degrees of deixis: (1) proximate, (2) intermediate, and (3) distant (Ubykh, however, has only two degrees of deixis). Postpositions are the rule. A particularly notable feature of the Northwest Caucasian languages is their highly complex (polysynthetic) verb systems. Gerundive and participial forms are also widely used. Word order is SOV. The lexicon is analyzable into a small number of short roots.

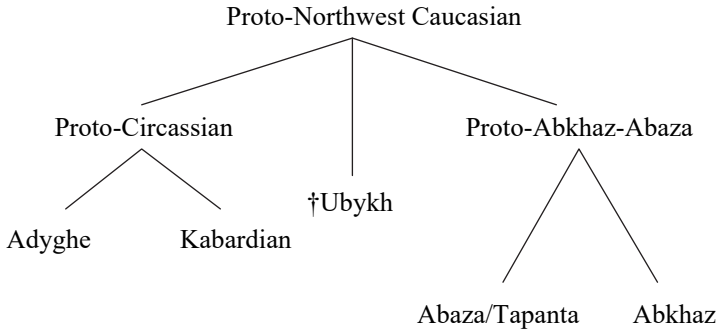
21.2. COLARUSSO'S THEORIES I: INITIAL REMARKS AND PHONOLOGY

The area between and north of the Black and Caspian Seas was undoubtedly the final homeland on Proto-Indo-European — it was where Proto-Indo-European developed its unique characteristics. However, it is probable that this was not the original homeland of the speakers of what was to become Proto-Indo-European. In

a paper published in 1997, Johanna Nichols argued that the earliest Indo-European speech community was located in Central Asia (note also Uhlenbeck 1937). She proposes that Pre-Proto-Indo-European spread westward across the steppes, eventually arriving on the northeastern shores of the Black Sea. I support this scenario. I would place the Pre-Indo-Europeans north of the Caspian and Aral Seas at about 7,000 BCE, and I would date their initial arrival in the vicinity of the Black Sea at about 5,000 BCE — this is somewhat earlier than the date Nichols assigns. No doubt, the immigration occurred in waves and took place over an extended period of time. Though it is not known for certain what language or languages were spoken in the area before the arrival of Indo-European-speaking people, it is known that the Pre-Indo-Europeans were not the first inhabitants of the area — several chronologically and geographically distinct cultural complexes have been identified there. This is an extremely critical point. The contact that resulted between these two (or more) linguistic communities is what produced the Indo-European parent language.

Fortunately, there are clues regarding who may have been there when the Pre-Indo-Europeans arrived on the shores of the Black Sea. In a series of papers published over the past twenty-five years or so, John Colarusso (1992a, 1994, 1997, and 2003) has explored phyletic links between Proto-Indo-European and Northwest Caucasian. Colarusso has identified similarities in both morphology and lexicon — enough of them for Colarusso to think in terms of a genetic relationship between Proto-Indo-European and Northwest Caucasian. (The Northwest Caucasian family tree is shown below.) He calls their common ancestor "Proto-Pontic", which he dates to roughly 10,000 BP (9,000 to 7,000 BCE).

The Northwest Caucasian family tree:



Notes:

1. Ubykh is now extinct. The last native speaker of the language, Tevfik Esenç, passed away in 1992.
2. Abaza is also called Tapanta (T'ap'anta).
3. Chirikba (1996a) considers Hattic to have also been a Northwest Caucasian language.

4. The Adyghe (also called "West Circassian") branch of Circassian is made up of many dialects, the most important of which are Temirgoy, Bžedux, and Šapsegh.
5. Kabardian is also called "East Circassian" — East Circassian also includes Besleney.

Colarusso begins by discussing the phonology of Proto-Indo-European, and he proposes a revised ("fortified") phonemic inventory for Proto-Indo-European. He then lists several grammatical formants common to both language families. Next, he presents a number of lexical parallels, including preverbs, numerals, particles, and "conventional cognates". On the basis of his study, he concludes that there is evidence, albeit preliminary, for a genetic relationship between Proto-Indo-European and Proto-Northwest Caucasian, and he posits a common proto-language, which he names "Proto-Pontic".

Colarusso (1992a:48, 1994:18, and 1997:146) reconstructs the following phonological system for Proto-Pontic (the alleged ancestor of Proto-Indo-European and Proto-Northwest Caucasian), which he dates to roughly 10,000 BP:

Consonants:	pʰ	p	b	-			m			w
	tʰ	t	d	t’			n	r	l	
	cʰ	c	ʒ	c’	s	z				
	čʰ	č	ǯ	č’	š	ž				y
	ƛʰ	ƛ	λ	ƛ’						
	kʰ	k	g	k’	x̂	ĝ				
	qʰ	q	-	q’	x	ɣ				
					ẖ	ʕ				
				ʔ	h					
Vowels:				i		u				
				e	ə	o				
					a					

Though there are many points of agreement between the phonological systems posited by Colarusso for Proto-Pontic and by me for Proto-Nostratic, the main differences are: (A) I do not posit a separate series of plain (unaspirated) voiceless obstruents; (B) I posit a series of rounded gutturals ("labiovelars"); (C) I posit a series of palatalized alveolars; (D) I do not posit a series of lateral approximants, and (E) I posit fewer laryngeals. The Proto-Nostratic phonological system may be reconstructed as follows (see Chapter 12 for details):

Stops and Affricates:

pʰ	tʰ	cʰ	čʰ	tʸʰ	t͡ɬʰ	kʰ	kʷʰ	qʰ	qʷʰ		
b	d	ʒ	ǯ	dʸ	d͡ɮ (?)	g	gʷ	ɢ	ɢʷ		
p’	t’	c’	č’	t’ʸ	t͡ɬ’	k’	k’ʷ	q’	q’ʷ	ʔ	ʔʷ

Fricatives:

	s	š	s^y	x	x^w		h	ħ
	z	ž (?)	z^y (?)	ɣ				ʕ

Glides:

w		y

Nasals and Liquids:

m	n		n^y	ŋ
	l		l^y	
	r		r^y	

Vowels:

	i (~ e)	u (~ o)
	e	o
	(ə ~) a	

Also the sequences:

iy (~ ey)	uy (~ oy)	ey	oy	(əy ~) ay
iw (~ ew)	uw (~ ow)	ew	ow	(əw ~) aw

For Proto-Nostratic, I set up a series of non-phonemically aspirated obstruents. There is some evidence, albeit limited, that two series may be warranted: (A) aspirated voiceless obstruents and (B) unaspirated voiceless obstruents — exactly what Colarusso has set up for Proto-Pontic. The evidence comes from Afrasian. For Proto-Afrasian, a separate phoneme **f* must be posited in addition to a voiceless bilabial stop **p*, and both of these correspond to voiceless bilabial stops in the other Nostratic daughter languages. Setting up two series at the Proto-Nostratic level would make it easy to account for Proto-Afrasian **f*, which would be seen as the reflex of an original phonemic voiceless bilabial aspirated stop **p^h* distinct from **p*. In this scenario, we would then have to assume that the aspirated and the unaspirated obstruents have merged in the remaining Nostratic daughter languages (as well as in Proto-Afrasian except in the bilabial series).

Now, let us look a little more closely at Proto-Indo-European itself. Colarusso sets up a three-way contrast for his "Fortified PIE": (A) voiceless aspirated, (B) plain voiced, and (C) glottalized, thus:

Consonants:	p^h	b	-		m		w
	t^h	d	t’	s	n	r	l
	k^{hy}	g^y	k’^{y}				
	(k^h	g	k’)				
	k^{hw}	g^w	k’^{w}				
	q^h	-	q’	x	ɣ		
	q^{hw}	-	q’^{w}	x^w	ɣ^w		

	ḫ	ʕ
	ḫʷ	ʕʷ
ʔ	h	
ʔʷ		

Vowels: ə ~ a (plus tonal stress)

Note: According to Colarusso, the laryngeals were lost in stages. The earliest to be lost were **ʔ*, **h*, and **ʔʷ*. The loss of these laryngeals between preceding short vowels and a following obstruent gave rise to "inherently" long vowels. The remaining laryngeals underwent various changes and were eventually lost altogether prior to the emergence of the non-Anatolian daughter languages. Some laryngeal reflexes persisted in Anatolian.

Gamkrelidze—Ivanov, in a number of works, also set up a three-way contrast: (A) voiceless (aspirated), (B) voiced (aspirated), and (C) glottalized. In their system, the feature of aspiration is viewed as phonemically irrelevant, and the phonemes in question can be realized either with or without aspiration depending upon the paradigmatic alternation of root morphemes. They set up this alternation mainly to account for instances of Grassmann's Law. However, as pointed out by Brian Joseph in a paper read before the 1994 Annual Meeting of the Linguistic Society of America, this reconstruction runs into problems in Italic (cf. Joseph—Wallace 1994; see also Stuart-Smith 2004). Indeed, it will probably turn out that Grassmann's Law should not be viewed as pan-Indo-European but, rather, as operating strictly in certain dialect groups. Now, most scholars, regardless of whether they follow the traditional reconstruction of Proto-Indo-European or the radical revisions proposed by Gamkrelidze, Hopper, and Ivanov, set up a three-way contrast for the obstruents — in other words, they do not set up phonemic unaspirated voiceless beside phonemic aspirated voiceless obstruents. The main exception is Oswald Szemerényi, who argued forcefully that two separate series should be set up. The fact is that, in most instances, the traditional voiceless aspirates can be explained as secondarily derived. Moreover, the evidence for their existence is restricted to two or three branches of Indo-European, and the examples found there are usually explained as developments specific to these branches. Nonetheless, there have always been a handful of examples that cannot be explained as secondarily derived. In light of Colarusso's proposals, the whole question may merit re-examination. It may turn out that Szemerényi was right all along. Moreover, setting up phonemic aspirated voiceless beside phonemic unaspirated voiceless obstruents may eliminate some of the objections that have been raised against the reinterpretation of the Proto-Indo-European consonant system proposed by Gamkrelidze—Ivanov.

It seems to me that Colarusso posits a greater number of "laryngeal" phonemes for Proto-Indo-European than required either by internal Indo-European evidence or by evidence from the other Nostratic daughter languages. Extremely good and plentiful cognates containing "laryngeals" can be established between Proto-Indo-

European and Proto-Afrasian, and the "laryngeals" are better preserved in the Afrasian branch than in any of the other Nostratic daughter languages. For Proto-Afrasian, either four or six "laryngeals" are typically posited, though there is not unanimity here: (A) *ʔ (glottal stop), (B) *h (voiceless laryngeal fricative), (C) *ħ (voiceless pharyngeal fricative), (D) *ʕ (voiced pharyngeal fricative), (E) *x (voiceless velar fricative), and (F) *γ (voiced velar fricative). There may also have been rounded "laryngeals" in Proto-Afrasian. I would set up the same "laryngeals" for Pre-Proto-Indo-European. I assume that the voiceless and voiced velar fricatives first merged with the voiceless and voiced pharyngeals, respectively, and that these became multiply-articulated pharyngeal/laryngeals in later Proto-Indo-European (for details, see the Appendix to Chapter 4). This assumption is made to account for their vowel-coloring properties. The whole question concerning the "laryngeals" remains open, though. The quality and quantity of the cognates that can be established between Proto-Indo-European and related languages, especially Afrasian, may require that additional "laryngeal" phonemes be set up for Proto-Nostratic. Indeed, there is good evidence to support the reconstruction of rounded "laryngeals" in Proto-Nostratic as well.

21.3. RECONSCRUCTED PHONOLOGICAL SYSTEMS AND SOUND CORRESPONDENCES

The phonological system reconstructed for Common Abkhaz by Chirikba (1996a: 58—59 and 1996b:xi) is as follows (his transcription has been retained; where different, the symbols used in this chapter are shown in parentheses):

	Stops	Affricates	Spirants	Resonants	Glides
Labial:	b p p’ p’ʷ		(v) f	m	w
Dental:	d t t’ dʷ tʷ t’ʷ	ʒ c c’	z s	n r	
Dental-Alveolar:		ʒ́ ć ć’ ʒ́ʷ ćʷ ć’ʷ	ź ś źʷ śʷ		
Alveolar:		ǯ č č’ ǯʷ čʷ č’ʷ ǯ′ č′ č’′	ž š žʷ šʷ ž′ š′		
Palatal:					j
Lateral:				l	
Velar:	g k k’ gʷ kʷ k’ʷ g′ k′ k’′				
Uvular:	q q’ qʷ q’ʷ q’′			γ (= ɣ) x̌ γʷ (= ɣʷ) x̌ʷ	

						ɣ′ (= ɣ′)		
						x̌′		
Pharyngeal:						ɦ ħ		
						ɦº ħº		
Vowels:	a ə							

The phonological system reconstructed for Proto-Circassian by Kuipers (1975:4) is as follows (his transcription has been retained; where different, the symbols used in this chapter are shown in parentheses) (see also Chirikba 1996a:110—111):

Labials:	pʰ	p:	b	p’				
Dental Stops:	tʰ	t:	d	t’				
Dental Affricates/ Sibilants:	cʰ	c:	ʒ	c’		s	z	
Alveolopalatals:						s̡ (ś)	z̡ (ź)	s̡’ (ś’)
Alveolopalatals: labialized:	c̡ʰº (ćʰº)	c̡:º (ć:º)	ʒ º (ʒ́º)					
Palatals:	čʰ	č:		č’	šʰ	š:	ž	
Palatals: palatalized:	čʰ′	č:′	ǯ′	č’′	šʰ′	š:′	ž′	
Laterals:						λ	l	λ’
Velars:	kʰ	k:	g	k’		x	ĝ (ɣ)	
Velars: labialized:	kʰº	k:º	gº	k’º		xº		
Uvulars:	qʰ	q:		q’		x̌	ǧ	
Uvulars: labialized:	qʰº	q:º		q’º		x̌º	ǧº	
Pharyngeal:						ħ		
Others:	h, y, w, m, n, r							
Vowels:	a ə							

Note: The Proto-Circassian voiced uvular fricative *ǧ is from an earlier voiced uvular stop *ɢ, on the one hand, and from an earlier voiced pharyngeal fricative *ʕ, on the other hand.

The Ubykh phonemic system is discussed at length by Vogt (1963:13—33). Cf. Colarusso 1975 for a comprehensive treatment of Northwest Caucasian phonology in general. See also Hewitt 2005:94—102.

Finally, it may be noted that Chirikba (2016:9—11) reconstructs the early Proto-Northwest Caucasian phonological system as follows (his transcription has been retained):

Consonants:	b	p^h	p’							
	d	t^h	t’						m	w
				ʒ	c	c’	z	s	n	
				ǯ	č	č’	ž	š	r	
				Ł	ƛ	ƛ’	L	ƛ	l	
	g	k^h	k’		ĝ	x				j
	ɢ	q^h	q’		ɣ	χ				
			ʔ		ʕ	H				
Vowels:	i	ü		u						
	e	ö	ə	o						
			a							

Note: Cf. Colarusso (1989:28) for a slightly different reconstruction. The biggest difference between Colarusso and Chirikba is that Colarusso reconstructs a four-way contrast in the system of stops and affricates of (1) voiceless aspirated, (2) plain voiceless, (3) voiced, and (4) glottalized (ejectives), thus (using the dentals for illustration): *t^h, *t, *d, *t’. Colarusso also reconstructs a smaller set of vowels than Chirikba.

The Proto-Indo-European phonological system used in this chapter is as follows:

Obstruents:	I	p^h	t^h	k^h	k^{wh}	
	II	b^h	d^h	g^h	g^{wh}	
	III	(p’)	t’	k’	$k’^w$	
			s			
Laryngeals:		ʔ (= $ə_1$)	h (= $ə_4$)	ħ͡h (= $ə_2$) ʕ͡ɦ (= $ə_3$)		
Resonants:	m/m̥	n/n̥	l/l̥	r/r̥	w/u	y/i
Vowels:	e	o	a	i	u	
	ē	ō	ā	ī	ū	

Note: Series I is voiceless aspirated (= traditional plain voiceless stops: *p, t, k, k^w); series II is voiced aspirated (= traditional voiced aspirates: *bh, *dh, *gh, *g^wh); and series III is glottalized (ejectives) (= traditional plain voiced stops: *b, *d, *g, *g^w).

The following sound correspondences can be provisionally established between Proto-Indo-European, Common Abkhaz, and Proto-Circassian:

Proto-Indo-European	Common Abkhaz	Proto-Circassian
*pʰ	*p	*pʰ, *p:
*tʰ	*t, *c, *ć, *č, *č′	*tʰ, *t:, *cʰ, *c:, *čʰ, *č:, *čʰ′, *č:′
*kʰ	*k, *k′, *q	*kʰ, *k:, *qʰ, *q:
*kʷʰ	*kᵒ, *qᵒ	*kʰᵒ, *k:ᵒ, *qʰᵒ, *q:ᵒ
*pʰVs-	*psV-	*PsV-
*pʰVh̑h-	*px̌V-	
*p’	*p’	*p’
*t’	*t’, *c’, *ć’, *č’, *č’′	*t’, *c’, *č’, *č’′
*k’	*k’, *k’′, *q’, *q’′	*k’, *q’
*k’ʷ	*k’ᵒ, *q’ᵒ	*k’ᵒ, *q’ᵒ
*bʰ	*b	*b
*bʰVs-	*bzV-, bžV-	*PzV-
*dʰ	*d, *ʒ, *ʑ, *ǯ, *ǯ′	*d, *ʒ, *ǯ, *ǯ′
*gʰ	*g, *g′, *ɣ (< *ɢ), *ɣ′	*g, *ǧ (< *ɢ), *ɣ
*gʷʰ	*gᵒ, *ɣᵒ (< *ɢᵒ)	*gᵒ, *ǧᵒ (< *ɢᵒ)
*s	*s, *ś, *š, *z, *ž, *ž′	*s, *ś, *š, *šʰ, *šʰ′, *š:, *š:′, *z, *ž, *ž′
*ʔ (= *ḛ₁)	*Ø	*Ø
*h (= *ḛ₄)	*Ø	*h
*ħh̑ (= *ḛ₂) (< *ħ)	*ħ, *x̌, *x̌′	*ħ, *x, *x̌
*ʕɦ̑ (= *ḛ₃) (< *ʕ)	*ɦ (< *ʕɦ̑ < *ʕ)	*ǧ (< *ʕ)
*w	*w	*w
*y	*j	*y
*m	*m	*m
*n	*n	*n
*n̥	*a	*a
*l	*l	*l, *ƛ
*r	*r	*r
*a, *e, *o	*a, *ə	*a, *ə
*i, *u	*ə	*ə

21.4. COLARUSSO'S THEORIES II: MORPHOLOGICAL PARALLELS BETWEEN PROTO-INDO-EUROPEAN AND PROTO-NORTHWEST CAUCASIAN

Colarusso (1992a:26—30) presents a series of nominal suffixes that he claims are common to Proto-Indo-European and Proto-Northwest Caucasian — these are:

Proto-Indo-European	Proto-Northwest Caucasian
1. Athematic *-*Ø*	Athematic stems
2. Thematic *-*e/o*-	Thematic stems
3. Adjectives in *-*(e)w*-	Predicative and adverbial *-*u*, *-*(ə)w*
4. Adjectives in *-*yo*-	Adjectives in *-*ĝa*-
5. Abstract adjectives in *-*iyo*-	Adjectives in *-*ya*-
6. Opposition with other stems: *-*yo*-	Enclitic copula *-*g^ya*- 'and'
7. Used in oblique cases: *-*en*-	Oblique case, genitive formant *-*n*- or *-*m*-
8. Secondary NPs: *-*no*-	Derivational suffix *-*nə*-
9. Participle endings *-*eno*-, *-*ono*-	"Pro-tense" *-*ən*- (replaces tense in concatenated or subordinated ["dependent"] forms)
10. Old kinship suffix *-*(t)er*-	Participle *X-*t^h*-ər*
11. Heteroclitic *-*r*-/*-*n*-	*-*(ə)r* in absolutive, *-*əm*- or *-*ən*- in oblique cases
12. Comparative *-*yes*-/*-*yos*-, superlative *-*is-t(h)o*-	Comparative *-*y-ć^h*, superlative *-*y-ć^h-(də)da*
13. Agents in *-*ter*-, *-*tel*-	Instrumental (Abaza) -*la*-
14. Instrumentals in *-*tro*-, *-*tlo*-, *-*dhro*-, *-*dhlo*-	Instrumental *-*la*- (same as no. 13)
15. Nominal action suffix *-*men*-	Old affix *-*ma*

Though I have reservations about several of the comparisons made by Colarusso, for the most part, I find his examples to be reasonably straightforward. What strikes me is the nature of the examples more than the form. First, as I tried to show in a previous chapter of this book, Early Proto-Indo-European did not have adjectives as a separate grammatical category. Rather, they arose at a later date. Moreover, even at a fairly late date in its development, Proto-Indo-European may not have possessed comparative and superlative degrees. Consequently, the above comparisons between Proto-Indo-European and Proto-Northwest Caucasian involving adjectives, including formants indicating comparative and superlative degrees, if they are real, point to language contact at a late date rather than genetic relationship. Next, the development and proliferation of thematic stems was a late development in Proto-Indo-European. Again, if the comparison here with Northwest Caucasian is real, it is another indication of language contact. Finally, the same may be said about the remaining comparisons as well — nearly all of the

Proto-Indo-European examples cited by Colarusso are relatively late formations, most of which arose within the Indo-European parent language proper long after it had separated from the other Nostratic daughter languages.

Colarusso (1992a:30—32) then turns his attention to a discussion of several other endings, such as participles, abstracts, cases, etc.:

Proto-Indo-European	Proto-Northwest Caucasian
Participles, abstracts, etc.	
1. Active participle *-*ent*-, *-*ont*-, *-*n̥t*-	Old participle endings: Abaza -*n*; Ubykh -*nə*, -*na*, plus (Circassian) durative -t^h-
2. Perfect active participle *-*we/os*-, *-*we/ot*-	Aspect suffix *-*w(a)*-
3. Feminines and abstracts in *-*ā*, *-*y-ā* (< *-*eA*, *-*y-eA*)	*-*xa* ‘woman’
4. Collectives in *-*yā*	Collective *-*ĝa*
Case forms	
5. Accusative *-*m*/*-n*	Oblique: Circassian -*m*, Ubykh -*n*
6. Genitive/ablative *-*(e/o)s*	Old genitive *-*š*
7. Genitive (thematic) *-*o-s(y)o*	*-*š-y-a* > *-$š^y$ oblique of pronouns in West Circassian
8. Ablative (thematic) *-*ō*	Ubykh -$x^y a$, Abkhaz-Abaza -$x^y a$ ‘place’
9. Dative *-*ey*-	Directive-dative *-*y(-a)*
10. Locative *-*i*	Old Bžedux dative of pronouns -*y*
11. Instrumental *-*ē*, *-*ō*	*-*ə-a* > *-*ə̄*, *-*a-a* > *-*ā*, with *-*a* the same as in the thematic ablative

Here, once again, we are dealing with late formations in Proto-Indo-European. In Chapter 18 (§18.6), we saw how and when the feminine arose within Proto-Indo-European and how the system of case endings was gradually built up.

Colarusso (1992a:32—33) next discusses anaphoric, deictic, and relative stems. He then moves on to personal pronoun stems.

Proto-Indo-European	Proto-Northwest Caucasian
1. Anaphora: *so-, *to-	*śa ‘what’, *t^hə ‘where’
2. Deixis: *-w- > Sanskrit *asau*	*wə- ‘that (near hearer)’
3. Relative: *yo-	Abkhaz-Abaza *y*- relative initial verbal index

4.	Nominative first person personal pronoun **egō*, oblique **-(e)m*	**m-* ‘that near me’
5.	Second person personal pronoun **tu*	**w-* (< **t^hw-*) (f.) ‘you’

Most of these comparisons seem just a little contrived. Interestingly, Colarusso derives the Proto-Indo-European first person personal pronoun stem **egō* from Proto-Pontic **ʔə-k’-*, which is the same type of derivation I have proposed: traditional Proto-Indo-European **egō* < Early Proto-Indo-European **ʔe-k’-* (see Chapter 19, §19.8). The origin of this pronoun in Proto-Indo-European is rather transparent — it was a compound deictic stem meaning something like ‘this one here’ (cf. Lehmann 2002:188—189; Georgiev 1981:58).

Colarusso (1992a:33—35) lists three preverbs (old nouns) common to Proto-Indo-European and Proto-Northwest Caucasian and also compares Proto-Indo-European “final **s*” with Proto-Northwest Caucasian old oblique in **-š*. Most of these are convincing comparisons. Two of the three preverbs have cognates in other Nostratic languages.

	Proto-Indo-European	Proto-Northwest Caucasian
1.	**perə̯-* ‘before’ (< ‘front’)	**p^ha-r-(a-y-)* ‘front-along- (dat.-dir.-)’
2.	**en-* ‘in’ (< ‘interior, inside’)	Abaza *-n-* in *n-c’a-ra* ‘in-place-inf.’ = ‘to place inside’
3.	**et-* ‘without, outside’ (< ‘exterior, outside’)	Abaza *-t-* ‘from inside out; from below upwards’ (cf. *t-ga-ra* ‘out-drag-inf.’ = ‘to drag something out’)
4.	Final **s*	Old oblique in **-š*
5.	**r̥* ‘and’	**-ra* ‘and’
6.	**ge* ‘because; terminus’	Dative-instrumental **-y-k’*

Note: For the last form, Colarusso reconstructs Proto-Pontic **k’ə* ‘because, arising from, issuing from’.

Colarusso (1992a:35—40) finishes his discussion of morphology by comparing verbal desinences and suffixes. Some of the parallels presented by Colarusso are intriguing and deserve further investigation. Specifically, I would like to see more about what Proto-Northwest Caucasian might be able to tell us about the Proto-Indo-European athematic ~ thematic conjugational types.

I am skeptical about the Proto-Indo-European perfects (1992a:37, no. 48) discussed by Colarusso, while the Proto-Indo-European primary active present athematic ending **-i* (1992a:38, no. 50) is usually derived from a deictic particle meaning ‘here and now’ (cf. Kerns—Schwartz 1972:4; Watkins 1969:46).

The explanation given by Colarusso (1992a:39, no. 52) for Proto-Indo-European “*s*-movable” is not convincing and should be abandoned, and the same goes for the derivation of the 1st person singular thematic personal ending **-ō* from **-o-s* through compensatory vowel lengthening upon loss of the **-s* (1992a:39, no. 53).

Lastly, the following is a list of the verbal desinences and suffixes discussed by Colarusso:

Proto-Indo-European	Proto-Northwest Caucasian
1. Athematic: Sanskrit *ád-mi* 'I am eating'; Thematic: Sanskrit *rod-ā-mi* 'I am crying'	Basic verb athematic: *-t^h- 'to be'; *-*w-k'*- -valence-kill-, Ubykh *Ø-s-k'^{w}-q'á* 'it-I-kill- past' = 'I killed it'; Verbs with stem final -*a*- showing thematic conjugation: West Circassian *psaaƛa* 'word', *t-zara-psaƛa-a-ɣa* 'we-reciprocal-converse-thematic V-past' = 'we talked'
2. Intensive reduplication: Sanskrit *dediṣ-te* 'he teaches and teaches'	West Circassian -*śa-śa*- 'fall-fall' = 'to Fall (as of leaves)'
3. Proto-Indo-European themes with *-ē-, *-ō-, *-ā-:	
I. *-ē- (< *-$e\underset{\sim}{ə}_1$-) stative sense	*-*q'a-V*- affix for action of intimate concern to the speaker
II. *-ā- (< *-$e\underset{\sim}{ə}_2$-) iterative sense	*-*x*- iterative
III. *-ō- (< *-$e\underset{\sim}{ə}_3$-) indicating excess	*-*q'^{w}a* 'excess'
4. Causative-iterative: *-*eyo*-, *-*ī*-, *-*y*-	Ubykh -*aay*- 'again, finally'
5. Sigmatic aorist: *-*s*-	Circassian -*z*- stative or accomplished past participle with past pt.
6. **n*-infix presents	Ubykh -*n* dynamic present
7. Primary active 3rd plurals in *-*n*-; extended by *-*ti* > *-*(e/o)-n-ti*	Ubykh 3rd plural -*na*-
8. Middle voice in *-*dh*-	Abaza optative of self-interest *s-č'a-n-da* 'I-eat-dep.-middle' = 'O, if I could eat!'
9. Perfects in *-*k*-, *-*g*-, *-*gh*-	*-*q'a* past
10. Optative in *-*yē*-, *-*yə*-	*-*əy*- optative, concessive
11. Primary, active, present, athematic *-*i*	*-*y*- present
12. Relic impersonals in **r* (cf. Sanskrit *śe-re* 'they are lying down'; Old Irish *berir* 'he is carried'; Umbrian *ier* 'one goes')	*-*ra* optional present
13. Futures in *-*($\underset{\sim}{ə}$)s(y)e-/*-*($\underset{\sim}{ə}$)s(y)o*-	*-*š*- future
14. Intensives in *-*sk(e/o)*-	*-*śx̂o* > Proto-Circassian *-*śx̂^{w}ə*
15. Augment **e*- (marks the past)	**ʔ(a)* > Proto-Circassian **q'(a)*

Colarusso derives the augment from Proto-Pontic **ʔ(a)* '(in) hand', which was "originally an independent adverb before the verb denoting accomplishment of action".

Colarusso (1992a:40—42) continues by presenting an alternative explanation for certain stem patterns to that offered by Benveniste's theory of the Proto-Indo-European root (cf. Benveniste 1935:147—173). While Colarusso's views on stem patterning accurately describe what is found in Northwest Caucasian, they are a poor fit for Proto-Indo-European.

21.5. LEXICAL EVIDENCE FOR CONTACT BETWEEN PROTO-INDO-EUROPEAN AND NORTHWEST CAUCASIAN

Colarusso completes his study (1992a:42—48) by listing twenty possible cognates ("conventional cognates") between Proto-Indo-European and Northwest Caucasian. Over half of these alleged "cognates" are not convincing. Colarusso subsequently proposed additional "cognates" (Colarusso 2003), and I have also proposed a substantial number of possible lexical comparisons (Bomhard 2019d). Altogether, there are enough good comparisons to demonstrate that there must have been prolonged and substantial contact between Proto-Indo-European and Northwest Caucasian. The following is a complete list of the lexical comparisons between Proto-Indo-European and Northwest Caucasian that have been gathered to date (this list includes several comparisons proposed by Colarusso as well as those listed in Chapter 13, §13.2 of this book):

As indicated above, the Proto-Indo-European forms given in the following lexical parallels are reconstructed in accordance with the Glottalic Model of Proto-Indo-European consonantism (for specifics on the Glottalic Theory, cf. Bomhard 2016, Salmons 1993, and especially Gamkrelidze—Ivanov 1995.1:5—70).

It should be noted that, while investigating possible lexical parallels between Proto-Indo-European and Northwest Caucasian, new interpretations regarding a number of existing Indo-European etymologies presented themselves. These are discussed in detail below.

The following lexical parallels are arranged by semantic fields, on the model of Carl Darling Buck's *A Dictionary of Selected Synonyms in the Principal Indo-European Languages* (1949).

I. Particles

1. (1) Proto-Indo-European **ʔen-* 'in, into, among, on' (**ʔ* = **ə₁*): Greek ἔν, ἔνι, ἐνί 'in, on, among, into, and besides'; Latin *in* (Old Latin *en*) 'in, on, among, into, on to, towards, against'; Oscan *en* 'in'; Old Irish *ini-*, *en-*, *in-* 'in, into'; Welsh *in* 'in'; Breton *en* 'in'; Gothic *in* 'in, into, among, by', *inn* 'into'; Old Icelandic *í* 'in, within, among', *inn* 'in, into'; Old English *in* 'in, on, among, into, during', *inn* 'in'; Old Frisian *in* 'in'; Old Saxon *in* 'in'; Old High German *in* 'in'; Old Prussian *en* 'inside, within'; Old Church Slavic *vъ(n)* 'in(to)'. (2) Proto-Indo-European locative singular ending **-n*: Greenberg (2000:150) considers various evidence for a locative ending in **-n*. The most convincing evidence he cites is the Vedic pronominal locatives *asmín* 'in that', *tásmin* 'in

this', and *kásmin* 'in whom?'. In these examples, the pronoun stem has been enlarged by an element *-sm(a)-*, to which a locative ending *-in* has been added. Since the final *-n* is missing in the cognate forms in Iranian, Burrow (1973:271) considers this to be a secondary formation, unique to Sanskrit. However, as Greenberg rightly points out, the Vedic forms can be compared with Greek pronominal datives in –ι(ν) such as Lesbian ἄμμιν, ἄμμι 'to us'. Benveniste (1935:87—99) also explores locative forms in *-n* in Indo-European — he (1935:88) cites the following examples from Sanskrit: *jmán*, *kṣāmán* 'in the earth', *áhan* 'on [this/that] day', *udán* 'in the water', *patan* 'in flight', *āsán* 'in the mouth', *śīrṣán* 'in the head', *hemán* 'in winter', *akṣán* 'in the eye'.

Northwest Caucasian: (1) Common Abkhaz **nə* locative: South Abkhaz *a-nə́-z-aa-ra* 'to be (on something)'. (2) Common Abkhaz locative **nə*, **-n-*. (3) Common Abkhaz *-nə* 'place, country' in, for example: Abzhywa *aps-nə́* 'Abkhazia'; Sadz *aps-nə́* 'Abkhazia'; Ahchypsy *aps-nə́* 'Abkhazia'.

2. Proto-Indo-European **ʔey-tʰ-* 'then, next' (**ʔ* = **$ə_1$*) (only in Greek): Greek εἶτα (Ionic, Boeotian, Messenian εἴτεν) 'and so, therefore, accordingly; then, next', ἔπ-ειτα (Ionic, Doric ἔπ-ειτε(ν)) 'thereupon, thereafter, then; afterwards, hereafter'.

   Northwest Caucasian: Common Abkhaz **ajta* 'again': South Abkhaz *ajta* 'again'; Abaza/Tapanta *jata-r-k'ᵒa-x̌* 'again'.

3. Proto-Indo-European **ʔo-pʰh(-i)* 'in front of, before, towards' (**ʔ* = **$ə_1$*; **h* = **$ə_4$*): Latin *ob* 'towards; about, before, in front of, over; for, because of, by reason of', *op-* in *optimus* 'best' (< 'foremost'); Venetic *op* (< **opi*) 'because of, for'; (?) Oscan **úp**, *op* (preposition with ablative) 'at, near, close to'.

   Notes:
   1. The above forms are sometimes derived from Proto-Indo-European **ʔepʰi*/**ʔopʰi* 'at, by', but this seems unlikely given the semantics of the Latin and Venetic forms, which point instead to 'in front of, before, towards' as the base meaning of their Proto-Indo-European ancestor (cf. Ernout—Meillet 1979:454; Untermann 2000:799—800).
   2. The position of Venetic is uncertain. Some scholars have stressed the features it shares with the Italic languages, while others have stressed the features it shares with the Celtic languages. Still others consider Venetic to be an independent branch of Indo-European.
   3. Oscan **úp**, *op* (preposition with ablative) 'at, near, close to' may belong here or it may be a derivative of Proto-Indo-European **ʔepʰi*/**ʔopʰi* 'at, by' (cf. Untermann 2000:800).
   4. As in Northwest Caucasian, the above Proto-Indo-European form is in all likelihood a combination of **ʔo+pʰh(-i)*. The second component, namely, **pʰh(-i)*, is preserved in the following: (1) Proto-Indo-European (extended

form) *p^heh-s- [*p^hah-s-] (> *p^hās-) ‘to puff, to blow; to reek (of), to smell (of)’ (Slavic only) (*h = *$ḫ_4$): Russian *paxnút'* [пахнуть] ‘to puff, to blow’, *páxnut'* [пахнуть] ‘to smell (of), to reek (of)’; Czech *páchnouti* ‘to be fragrant’; Polish *pachnąć* ‘to smell (of)’; (2) perhaps also: Proto-Indo-European (extended form) *p^heh-k'- [*p^hah-k'-] (> *p^hāk'-) ‘face, surface’ (Indo-Iranian only) (*h = *$ḫ_4$): Sanskrit *pā́ja-ḥ* ‘face, surface’; Khotan Saka *pāysa-* ‘surface’. All of these forms can be derived from an unattested Proto-Indo-European root *p^heh- [*p^hah-] ‘nose, face’ (> ‘front, beginning’, as in Northwest Caucasian [below]). It is on the basis of these forms that a second laryngeal (*h) is reconstructed in *ʔo-p^hh(-i) ‘in front of, before, towards’.

Northwest Caucasian:

A. Common Abkhaz *a+pə ‘before, in front’ (*pə ‘nose’) in: (1) Common Abkhaz Common Abkhaz *á+pə-x̌'a ‘at the front, earlier, at the beginning’; (2) *a+pə́-x̌'a ‘earlier, previously, before’; (3) Common Abkhaz *a+p-qá ‘ahead, before, earlier; at first’; (4) Common Abkhaz *pə́-n-ć'a (< *pə ‘nose’, *-n- locative, *-ć'a) ‘nose’ > Abaza/Tapanta *pə́nc'a* ‘nose’; Abkhaz *a-pə́nc'a* ‘nose’; Ashkharywa *a-pə́nc'a* ‘nose’. Cf. Bomhard 2019:42—43, no. 40.
B. Ubykh *faċ'á* ‘nose, tip’.
C. Circassian: (1) Proto-Circassian *p^ha ‘nose, front, beginning’: Bžedux *p^ha* ‘nose, front, beginning’; Kabardian *pa* ‘nose, front, beginning’; (2) Proto-Circassian *p^ha in *nap^{h}a ‘face’: Bžedux *nāp^{h}a* ‘face’; Kabardian *nāpa* ‘face’.

4. Proto-Indo-European *ʔot^h(i)- ‘back, away (from)’ (*ʔ = *$ḫ_1$): Lithuanian (pref.) *at-* ‘back’; Latvian (pref.) *at-* ‘back’; Old Prussian (pref.) *at-*, *et-* ‘back, away’; Old Church Slavic (prep.) *otъ* ‘from’; Russian (prep. with gen.) *ot(o)* [от(о)] ‘from, out of, for, against'; Czech (prep.) *od(e)* ‘from, away from’. Note: The Balto-Slavic forms are usually compared with the following, all pointing to Proto-Indo-European *ʔet^{h}i, with a wide range of meanings in the various daughter languages: Sanskrit *áti* ‘beyond, over; very, exceedingly’; Old Persian *atiy-* ‘beyond, across’; Avestan *aiti* ‘over, back’; Greek ἔτι ‘moreover, further, still’; Gaulish *eti* ‘also, further’; Latin *et* ‘and’; Gothic *iþ* ‘but’.

   Northwest Caucasian: Common Abkhaz *áta- in *áta-k'ə ‘to answer, to respond’ (*k'ə = ‘to catch, to grab, to hold’): South Abkhaz *ata-k'-ra* ‘to answer, to respond’.

   Notes:
   1. Chirikba (1996b:4) does not give a meaning for *áta- — it may have been something like ‘back, away (from)’.
   2. Assuming semantic development as in Gothic *and-hafjan* ‘to answer’ (*and-* ‘along, through, over’; *anda-* ‘towards, opposite, away from’ +

**hafjan* ‘to lift’ [< Proto-Indo-European **k^{h}ap^{h}-* ‘to seize, to grasp, to hold’, preserved as such in Gothic **haftjan* ‘to hold fast’; cf. Latin *capiō* ‘to take, to seize’]).

5. Proto-Indo-European **ʔoy-wo-* ‘one, a certain one, the same one’ (**ʔ* = **ḫ$_{1}$*): Sanksrit *evá* ‘so, just so, exactly so; like; indeed, truly, really; just, exactly, very, merely, only, even, at the very moment, immediately, scarcely, still, already, etc.’; Avestan *aēva-* ‘one; (adv.) thus, so’; Old Persian *aiva-* ‘one’; Greek οἶος ‘alone, only, single; the only one’; Tocharian B *-aiwenta* ‘group’ (?) (only in compounds).

   Northwest Caucasian: Common Abkhaz **ajə́-wa* ‘part of something, example, similar, like’ (**aj-* reciprocal prefix, **wa* ‘similar’): Bzyp *ajə́-wa* ‘part of something, example, similar, like’; Abzhywa *aj-wa* ‘part of something, example, similar, like’. Note also: Common Abkhaz **aj-pšə́* ‘like, as, similar’ (**aj-* ‘together’, **pšə* ‘to look’): South Abkhaz *ajpš* ‘like, as, similar’; Ashkharywa *ajpš-nə* ‘like, as, similar’.

6. Proto-Indo-European **ʕ̯ḫ̆ō̆-* (prefix) ‘near, near to, close to, towards’ (**ʕ̯ḫ̆* = **ḫ$_{3}$*): Sanskrit *ā-* (prefix) ‘near, near to, towards, from all sides, all around’, *ā* (separable adverb) ‘near, near to, towards; thereto, further, also, and’, *ā* (separable preposition with accusative or ablative) ‘near to, up to, to, as far as’; (with ablative) ‘away from, from; out of, of, from among’; (with locative) ‘in, at’; Greek (prefix) ὀ- ‘close by, near, with’.

   Northwest Caucasian: Common Abkhaz **ħa-* (< **ʕ̯ḫa-* < **ʕa-*) ‘hither, near to’ in, for example, **ħa-ś-k''a* ‘recently, nearby’: Bzyp *aa-śk''á* ‘recently, in the nearby’, *áa-śk''a-ra* ‘to move closer (hither)’; Abzhywa *aa-sk''á* ‘recently, in the nearby’, *áa-sk''a-ra* ‘to move closer (hither)’.

   Note: According to Chirikba (1999:157): “… for Proto-Circassian I reconstruct the voiced pharyngeals **ʕ*, **ʕ^{w}*. In my view, in Common Circassian and in Ubykh they merged with the uvular **ɣ*, **ɣ^{w}* [note: Kuipers writes **ǧ*, **ǧ^{ʷ}*], while in Common Abkhaz they changed into **ħ*, **ħ^{w}* (i.e. the weakened variants of **ʕ*, **ʕ^{w}*).” A similar development for **ʕ̯ḫ̆* (= **ḫ$_{3}$*) can be posited for Post-Anatolian Proto-Indo-European (cf. Bomhard 2018.1:72): **ʕ̯ḫ̆* > **ħ* > **h* > **Ø* initially before vowels (except in Pre-Proto-Armenian, where **ʕ̯ḫ̆* [and **ḫ̆ḫ* (= **ḫ$_{2}$*)] appears as *h* initially before vowels, as illustrated by the following example: Proto-Indo-European **ʕ̯ḫ̆owi-s* ‘sheep’ > Armenian *hov-iw* ‘shepherd’, but Sanskrit *ávi-ḥ* ‘sheep’; Greek ὄϊς, οἶς ‘sheep’; Latin *ovis* ‘sheep’; etc.) — **ʕ̯ḫ̆*, however, is preserved initially before vowels in the Anatolian Indo-European daughter languages: Hittite (nom. sg. or pl. ?) *ḫa-a-u-e-eš* ‘sheep’; Hieroglyphic Luwian *hawis* ‘sheep’; Luwian (nom. sg.) *ḫa-a-ú-i-iš* ‘sheep’; Lycian *χava-* ‘sheep’.

7. Proto-Indo-European *$b^h\check{e}$/*$b^h\check{o}$ emphatic particle: Gothic *ba* (encl. ptc.) ‘if, even though’; Avestan *bā* ‘truly’; Greek φή ‘as, like as’; Lithuanian *bà* ‘yes, certainly’; Old Church Slavic *bo* ‘for’; Russian (dial.) *bo* [бо] ‘if, for, because’.

   Northwest Caucasian:
   A. Common Abkhaz **ba* interrogative particle: South Abkhaz *ba* interrogative particle used in echo-questions, as in *d-aá-j-t’* ‘he came’ ~ *d-aá-j-t’ ba?* ‘did he?’ // ‘are you saying that he has come?’; it also occurs, for example, in *j-abá* ‘where?’ (< *j(ə)* ‘it’ + **a* deixis of place + **ba* interrogative element) and *j-an-bá* ‘when?’ (< **an* ‘when’ + **ba* interrogative element).
   B. Ubykh *-ba* verb suffix indicating uncertainty.

8. Proto-Indo-European *g^hi- enclitic particle of unknown meaning: Sanskrit *hí* enclitic particle: ‘for, because, on account of; assuredly, certainly; indeed’; Greek -χι in: οὐ-χί, μή-χι ‘not’, ναί-χι ‘yea, verily; aye, yes’.

   Northwest Caucasian:
   A. Common Abkhaz **-g′ə* ‘and, even, too’: Abkhaz *-g′ə* ‘and, even, too’, as in *wə́j-g′ə* ‘he/she too’.
   B. Ubykh *-g′ə* enclitic particle.

9. Proto-Indo-European **He$\underset{\smile}{ħh}$-* (> **ā*-) ‘to, towards, up to, in the direction of’ (Indo-Iranian only) (*$\underset{\smile}{ħh}$ = *$\underset{\sim}{ə}_2$): Sanskrit *ā*: as a prefix to verbs, *ā*- indicates movement to or towards; as a separable adverb, *ā* indicates ‘near, near to, towards; thereto, further, also, and; especially, even’; as a separable preposition with accusative or ablative, *ā* indicates ‘near to, up to, to, as far as’; Old Persian *ā* ‘to’; Avestan *ā* ‘hither, towards’; Khotan Saka (preverb) *ā*- ‘towards’. For more information, cf. Mayrhofer 1986—2001.1:157—158.

   Northwest Caucasian: Common Abkhaz **aǩ′ə́* (postposition) ‘to, in the direction of’: South Abkhaz *aǩ′* (postposition) ‘to, in the direction of’; Abaza/Tapanta *aǩ′ə́-la* (postposition) ‘to, in the direction of’.

10. Proto-Indo-European **hen-* [**han-*](/**h$\underset{\circ}{n}$-*) in **hen-t^{h}ero-* [**han-t^{h}ero-*], **hen-yo-* [**han-yo-*] ‘other’ (*h = *$\underset{\sim}{ə}_4$): Sanskrit *ántara-ḥ* ‘different, other, another’, *anyá-ḥ* ‘other, different’; Avestan *anyō* ‘other’; Khotan Saka *añа-* ‘other’; Gothic *anþar* ‘other, second’; Old English *ōþer* ‘other, second; one of two’; Old Frisian *ōther* ‘second one (of two)’; Old High German *andar* ‘other, different, second’ (New High German *ander*); Lithuanian *añtras* ‘other, second’; Old Prussian *antars* ‘second, other’.

   Notes:
   1. Some scholars consider these forms to be derived from Proto-Indo-European **ʔeno-*/**ʔono*, **no-* demonstrative pronoun: ‘this, that’ (see

above), while others consider them to be derived from a separate stem. Here, the second alternative is favored.

2. The bare stem may be preserved in Greek in the conditional particle ἄν ‘if, whether’.

Northwest Caucasian:

A. Common Abkhaz **a-* in: (1) Common Abkhaz **a-čá* ‘other’: South Abkhaz *ačá* ‘other’; Abaza/ Tapanta *ačá* ‘other’; Ashkharywa *ačá* ‘other’; Bzyp (indef. sg.) *ačá-k’* ‘other’; (2) Common Abkhaz **a-g'ə́-j(ə)* ‘another, the other’ (**a*, **jə* deictics, **g'ə* ‘and’): South Abkhaz *ag'ə́j* ‘another, the other’; Abaza/Tapanta *ag'ə́j* ‘another, the other’; (3) Common Abkhaz **d-ačá* ‘other, another’: South Abkhaz *dačá* ‘other, another’; Ashkharywa *dačá* ‘other, another’; Abaza/Tapanta *dačá* ‘other, another’.

B. (?) Proto-Circassian **ha* ‘that’: Bžedux *ā-r* ‘that’; Kabardian *ha-r* ‘that’.

Note: Proto-Indo-European **n̥* is reflected as **a* in Northwest Caucasian.

11. Proto-Indo-European **hew-* [**haw-*] ‘and, but, also’ (**h* = **$ə_2$*): Gothic *auk* ‘but, also’; Old English *ēac* ‘and, also’; Latin *aut* ‘either…or’, *au-tem* ‘but, on the other hand, indeed’; Oscan *aut* ‘but, or’; Greek αὖ ‘again, on the contrary’.

Northwest Caucasian: Proto-Circassian **hawa* ‘but’: Kabardian *hawa* ‘but’.

12. Proto-Indo-European **-k’e* particle of unknown meaning: Greek γε (Doric γα) enclitic particle, serving to call attention to the word or words which it follows, by limiting or strengthening the sense — added to the 1st sg. personal pronoun: ἔγωγε (Laconian ἔγωγα), ἔμοιγε, also added to demonstrative pronouns: κεῖνός γε, τοῦτό γε, etc. and (rarely) to interrogative pronouns: τίνα γε; Gothic *-k* added to the 1st and 2nd sg. personal pronouns: (acc. sg.) *mi-k* (< **me+k’e*) ‘me’, (acc. sg.) *þu-k* (< **t^hu+k’e*) ‘you’; Tocharian B *-k(ä)* strengthening particle, B *-ke* intensifying particle; Hittite *-k* added to the 1st and 2nd sg. personal pronouns: (acc. sg.) *am-mu-uk* ‘me’, (acc. sg.) *tu-uk* ‘you’. Note: Adams (2013:166) prefers derivation of Tocharian B *-k(ä)* from Proto-Indo-European **-$g^{(h)}$u*, though he notes that the etymology is uncertain and lists other possibilities, including the one suggested here.

Northwest Caucasian:

A. Common Abkhaz **-q’a* directional postposition ‘to/in the place’ in, for example, **a-q’a*: South Abkhaz *áq’a-ra* ‘this much, about (of size, quantity)’, *z-aq’á* ‘how much (relative and interrogative)’; Ashkharywa *áq’a-ra* ‘this much, about (of size, quantity)’; Abaza/Tapanta *áʔa-ra* ‘this much, about (of size, quantity)’, *z-ʔa-rá(-ha)* ‘how much (relative and interrogative)’, locative prefix *q’a-* in *q’a-ć’ºaǩ-ra* ‘to hide’.

B. Common Circassian **q'ə-* local preverb and **q'a* local element, found in **λə-q'a* 'trace', **q'a-g^{o}ə* 'courtyard', **g'ə-q'a* 'emplacement, place where something is placed'.
C. Ubykh **q'a* 'place', found in **q'a:la* 'place' (only used in compounds, such as *bĺəq'a:la* 'in seven places'), *λa-q'a* 'trace' (cf. Common Circassian **λə-q'a* 'trace'), *q'a-ʒ* 'to approach a place' (*-ʒ* 'to reach').

Note: For a detailed discussion of the Northwest Caucasian forms cited above, cf. Chirikba 1996a:218.

An alternative comparison may be with the following Northwest Caucasian forms:

A. Common Abkhaz **-q''a* in **-ć'^{o}-q''a* affirmative suffix: 'precise, accurate'.
B. Common Circassian **-q'a* affirmative suffix in **ś'-q'a* 'to know': Šapsegh *ś'q'ă* 'to know'.

Note: Chirikba (1996a:219—220) reconstructs Common Northwest Caucasian **-q''a* affirmative suffix.

13. Proto-Indo-European **mē* negative/prohibitive particle: 'no, not': Sanskrit *mā́* prohibitive particle: 'not, that not'; Armenian *mi* prohibitive particle: 'do not!'; Greek μή 'not'; Tocharian A/B *mā* 'not, no' (simple negation and prohibition); Albanian *mos* (< **mē+k^{wh}e*) prohibitive particle: 'do not!'.

Northwest Caucasian:
A. Proto-Circassian **mə-* negative prefix: Bžedux *mə-* negative prefix; Kabardian *mə-* negative prefix.
B. Common Abkhaz **m(ə)-* ~ **m(a)-* negative prefix, in, for example, (reduplicated) **ma(-wə)-ma-wə* 'no' (< **ma* negation + **-wə* adverbial suffix): South Abkhaz *mamáw*, *mawmáw* 'no'; Abaza/Tapanta *mamáw*, *mmaw* 'no'.
C. Ubykh *-m(a)-* negative affix.

14. Proto-Indo-European **mo-* encltic particle: 'and, but' (only in Anatolian): Hittite *-ma* enclitic clause conjunctive particle: 'and, but'; Palaic *-ma* enclitic particle: 'but'; Lycian *-me* sentence particle.

Northwest Caucasian: Common Abkhaz **ma* 'and, but; either…or': Abaza/Tapanta *ma* 'but'; South Abkhaz *ma* 'or, or else', *ma ... ma* '(n)either … (n)or'.

15. Proto-Indo-European (sentence particle) **ne-*/**no-* 'well, so; than, as': Sanskrit *ná* 'like, as'; Greek (enclitic particle) -νε; Armenian *na* 'then'; Latin *nam* 'certainly, for, well', (enclitic particle) *-ne* 'then?; whether'; Lithuanian *nè*,

nègi, *nègu* ‘than’; Latvian *ne* ‘than’; Old Church Slavic **ne* in *neže* ‘than’; Czech *než* ‘than’. Note also: Tocharian A (a particle which characterizes certain indefinite and relative pronouns) *-ne*, B ([intensifying] particle) *nai* ‘indeed, then, surely’; Lithuanian *néi* ‘as’; Greek (affirmative particle) ναί ‘really, yes, truly’.

Northwest Caucasian: Common Abkhaz **na-* ‘thither’ in: (1) South Abkhaz *nas* (< **ná-sə*: **na-* ‘thither’, **sə* ‘to go’) ‘then, afterwards’ (see below); (2) Bzyp *naq’* (< **ná-q’a*) ‘thither’, *nax̌'ə́* (< **n-a+x̌'ə́*: **na-* ‘thither’, **a+x̌'ə́* directional postposition) ‘there’; (3) Common Abkhaz **a-ná* ‘there’: South Abkhaz *aná* ‘there’; Abaza/ Tapanta *aná-ʔa* ‘there’; (4) Ashkharywa *anas* ‘yes’ (with the interrogative connotation ‘well, then’).

16. Proto-Indo-European **ne/o-+*se/o-* ‘then, for, because’: Hittite *na-aš-šu*, *na-aš-šu-ma*, *na-aš-ma* ‘either, or’; Latin *nisi* ‘if not, unless; except that, save, only; but, than; except, because’; Lithuanian *nès*, *nẽs*, *nėsà* ‘then, namely; for, because’.

    Note: This etymology was proposed by Mann (1984—1987:839), who reconstructs Proto-Indo-European **nes-*. However, in each case (Latin, Lithuanian, and Hittite), we are clearly dealing with a compound form (as in Common Abkhaz **ná-sə* cited below). For more information on Hittite *na-aš-šu*, cf. Puhvel 1984— .7:62—64; Kloekhorst 2008:596—597 (Hittitte *na-aš-šu* < **no-sue*), and, for Latin *nisi*, cf. Walde 1927—1932.II:170; Ernout—Meillet 1979:441—442 (Latin *nisi* < **ně sī*); Sihler 1995:79 (Old Latin *ne sei* ‘unless’). According to Endzelin (cited by Fraenkel 1962—1965.II:496), Lithuanian *nès*, *nẽs*, *nėsà* is from **ne est* ‘is it not so?’, as in French *n’est-ce pas?* See also Smoczyński 2007.I:422—423.

    Northwest Caucasian: Common Abkhaz **ná-sə* ‘then, afterwards’ (**na* ‘thither’, **sə* ‘to go’): South Abkhaz *nas* ‘then, afterwards’; Ashkharywa *nas*, (Kuv) *anas* ‘yes’ (with the interrogative connotation ‘well, then’).

17. Proto-Indo-European **pʰer-*/**pʰor-*/**pʰr̥-* base of prepositions and preverbs with a wide range of meanings such as ‘in front of, forward, before, first, chief, forth, foremost, beyond, etc.’: Sanskrit *páraḥ* ‘far, distant’, *puráḥ* ‘in front, forward, before’, *purati* ‘to precede, to go before’, *prá* ‘before, in front’, *práti* ‘towards, near to, against’, *pratarám* ‘further’, *prathamá-ḥ* ‘foremost, first’; Greek πέρᾱν, πέρην ‘across, beyond, on the other side’, παρά, παραί ‘beside’, πάρος ‘before’, πρό ‘before’, πρότερος ‘before, in front of, forward’, πρῶτος ‘first, foremost’, πρόμος ‘chief, foremost, first’, πρόκα ‘forthwith’, πρός, προτί ‘from’; Latin *per* ‘through, along, over’, *prae* ‘before, in front’, *prior* ‘former, first’, *prīmus* ‘first, foremost’, *prō* ‘before, in front of’; Gothic *faur* ‘for, before’, *frauja* ‘master, lord’, *fairra* ‘far’, *faura* ‘before, for, on account of,

from', *fram* 'from, by, since, on account of', *framis* 'further, onward', *frumists* 'first, foremost, best, chief', *fruma* 'the former, prior, first', *frums* 'beginning'; Old Icelandic *for-* 'before', *fjarri* 'far off', *fram* 'forward', *fyrr* 'before, sooner', *fyrstr* 'first'; Old English *feorr* 'far', *feorran* 'from afar', *for*, *fore* 'before', *forma* 'first', *fram* 'from', *frum* 'first', *fyrst*, *fyrest* 'first', *fyrmest* 'first'; Old Frisian *for* 'before', *fara*, *fore* 'before', *ferest* 'first', *forma* 'first', *vorsta*, *fersta* 'prince'; Old Saxon *for*, *fur* 'before', *for(a)*, *far* 'before', *forma* 'first', *furi* 'before', *furist* 'first, foremost', *furisto* 'prince'; Old High German *furi* 'before, for', *fora* 'before', *furist* 'first', *fir(i)-* 'opposite'; Lithuanian *prõ* 'through, past, by', *priẽ* 'at, near, by', *priẽš* 'against'; Hittite *pa-ra-a* 'forth', *pí-ra-an* 'before, forth'; Luwian *pár-ra-an* 'before, in front', *pa-ri-ya-an* 'beyond; exceedingly, especially'; Lycian *przze/i-* 'front, foremost', *pri* 'forth; in front'.

Northwest Caucasian: Common Abkhaz **pə-ra* 'through': South Abkhaz *a-par-ħ°a*, *a-pəra-ħ°a* 'apron' (< *a-pə́ra-ħ°a-ra* 'to tie up through'); Abaza/ Tapanta *pra-psá* 'curtain; apron' (< **pəra-psa* 'to throw through').

18. Proto-Indo-European **p^{h}os-* 'behind, after; afterwards, subsequently, at a later time': Latin *post* (adv.) 'behind, in the rear; after, afterwards, subsequently; shortly afterwards; (prep.) behind, after'; Sanskrit (adv.) *paścā́* 'being behind, posterior, later; afterwards; behind, at the back, after; at a later time, subsequently, at last'; Greek (dial.) πός 'at, to'; Lithuanian *pàs* 'near, at, by, to, with'; Old Church Slavic *pozdě* 'late'; Russian *pózdij* [поздий] 'late, tardy'; Tocharian B *päst* (unstressed, and later, byform of *pest*) 'away, back', *postäṁ* 'finally, afterwards; later', *postanu* 'later, latter; last'.

Northwest Caucasian:
A. Proto-Circassian **p^{h}asa* 'early, long ago': Bždedux *p^{h}āsa* 'early, long ago'; Kabardian *pāsa* 'early, long ago'.
B. Common Abkhaz **pása*: South Abkhaz *a-pása* 'early, earlier'; Abaza/ Tapanta *pása* 'early, earlier'.

19. Proto-Indo-European **sem-*/**som-* 'together, together with; one' (originally 'to gather together'): Sanskrit *sa* (< **sm̥-*) 'with, together with, along with', *sám* 'with, together with, along with, together, altogether', *sa-trā́* 'together, together with', *sámana-ḥ* 'meeting, assembly, amorous union, embrace', *samūbhá-ḥ* 'heap, collection'.

Northwest Caucasian: Proto-Circassian **sama* 'heap': Bždedux *sāma* 'heap'; Kabardian *sāma* 'heap'.

20. Proto-Indo-European ablative singular ending **-t^{h}os*, which has survived in relic forms in Sanskrit, Latin, Greek, and perhaps Armenian (cf. Sihler 1995: 246—247). Sihler gives the following examples: Sanskrit *-tas* in *agra-tás* 'in

front' (*ágra-* 'point, beginning'); Latin *-tus* in *in-tus* 'within', *fundi-tus* 'from the ground'; Greek -τος in ἐν-τός 'within', ἐκ-τός 'outside'. Another example is Sanskrit *mukhatás* 'from the mouth'.

Northwest Caucasian: Common Abkhaz **ta* 'from inside out; from below, upwards': Abaza/Tapanta *t-* in, for example, *t-ga-ra* 'to drag something out' (cf. *ga-rá* 'to carry, to bring, to take').

21. Proto-Indo-European **t'oḫ̲ḫ̲-* (> **t'ō-*) (adv.) 'also, too, in addition to' (**ḫ̲ḫ̲* = **ʔ₂*): Old English *tō* (prep.) 'to, into, too'; (adv.) 'besides, also, too; thereto, towards, in the direction of; in addition to, to such an extent; moreover, however'; Old Frisian *tō* (prep./adv.) 'to, until, for, against; in, at, on, according to'; (adv.) 'too'; Old High German *zuo*, *zua*, *zō* (prep.) 'to, towards, up to, unto; at, on, in'; (adv.) 'too, too much' (New High German *zu*); Latin *dō-* in *dōnec* (< **dō-ne-que*) 'as long as, while; until, up to the time at which'; Lithuanian *da*, *do* (prep./prefix) 'yet, still'; Old Church Slavic *do* (prep. gen.) 'up to, until'; Russian *do* [до] (prep. gen.) 'to, so far, as far as, till, until'; Czech *do* (prep.) 'into, up to'; Serbo-Croatian (prep.) *dȍ* 'to, until'.

Northwest Caucasian: Common Abkhaz **c'a-ħá* 'more than': Ashkharywa *c'aħa* 'more than'.

Note: Common Abkhaz **c'* = Proto-Indo-European **t'*.

II. Pronoun Stems, Deictic Stems

22. Proto-Indo-European demonstrative stem **ʔe-*/**ʔo-*, **ʔey-*/**ʔoy-*/**ʔi-* (< **ʔe-*/**ʔo-*+*-y/i-*) 'this, that' (**ʔ* = **ʔ₁*): Hittite enclitic demonstrative particle (nom. sg.) *-aš*, (acc. sg.) *-an*, (n. sg.) *-at* 'he, she, it'; (dat. sg.) *e-di*, *i-di*, *e-da-ni* 'to or for him, her, it'; Sanskrit *ayám* 'this' (gen. sg. m./n. *a-syá*, *á-sya*; f. *a-syáḥ*), *idám* 'this', (f.) *iyám* 'she, this', *á-taḥ* 'from this, hence' (< **e-to-s*), (n.) *e-tát* 'this, this here', *ihá* 'here', *e-ṣá* (f. *e-ṣā*) 'this'; Old Persian *a-* 'this', *aita-* 'this', *ima-* 'this', *iyam* this', *idā* 'here'; Avestan *a-* 'this', *aētaṯ* 'this', *ima-* 'this', *iδa* 'here'; Latin *is*, *ea*, *id* 'he, she, it; this or that person or thing'; Oscan *eiso-* 'this'; Old Irish *é* 'he, they', *ed* 'it'; Gothic anaphoric pronoun *is* 'he', *ita* 'it'; Old Icelandic relative particle *es* (later *er*) 'who, which, what'; Old Saxon *et*, *it* 'it'; Old High German *er*, *ir* 'he', *ez*, *iz* 'it'; Lithuanian *jìs* (< **is*) 'he'.

Northwest Caucasian:

A. Common Abkhaz **a* demonstrative pronoun: 'this' (only in compounds) (this is but a sampling): (1) Common Abkhaz **a-bá* 'this'; (2) Common Abkhaz **a-bá-tə* 'these'; (3) Common Abkhaz **a-ba-ná* 'there'; (4) Common Abkhaz **a-ba-rá* 'here'; (5) Common Abkhaz **a-bá-ra-t(ə)* 'these'; (6) Common Abkhaz **a-ba-rə́-jə* 'this'; (7) Common Abkhaz **á-tə* 'these'; (8) Common Abkhaz **a-də-na* 'something, this, that'; (9)

Common Abkhaz **á-ħa* ‘here (it is)’; (10) Common Abkhaz **a-ma-ná* ‘there’; (11) Common Abkhaz **a-ma-nə́-jə* ‘that’; (12) Common Abkhaz **a-ná* ‘there’; (13) Common Abkhaz **a-rá* ‘here’; (14) Common Abkhaz **a-wa* ‘that’; etc.

B. Ubykh *a-* definite article: ‘the’, also pronominal prefix of the 3rd person singular and plural.

23. Proto-Indo-European demonstrative pronoun **ʔobʰo-* (< **ʔo-+-bʰo-*) ‘this, that’ (**ʔ* = **ḫ₁*) (Anatolian only): Hittite (nom. sg.) *a-pa-(a-)aš* ‘that one; he, she, it’, *a-pí-ya* ‘then, there’; Palaic (acc. sg.) *(-)ap-a-an* ‘that one’; Luwian (nom. sg.) *a-pa-a-aš* ‘this (one); he, she, it; they’; Hieroglyphic Luwian (nom. sg.) *á-pa-sa* ‘that (one)’; Lycian (nom. sg.) *ebe* ‘this (one)’; Lydian (nom sg.) *bis* ‘he’.

Northwest Caucasian: (1) Common Abkhaz **a-bá-* (< **a+ba*) ‘this’ (only in compounds); (2) Common Abkhaz **a-bá-tə* ‘these’; (3) Common Abkhaz **a-bá-n-tə*, **a-ba-ná-tə* ‘those’; (4) Common Abkhaz **a-bá-śa* ‘thus’; (5) Common Abkhaz **a-bá-n(a)*, **a-ba-ná* ‘there’; (6) Common Abkhaz **a-ba-nə́-jə* ‘this’; (7) Common Abkhaz **a-bá-ra-t(ə)*, **a-ba-rá-t(ə)* ‘these’; (8) Common Abkhaz **a-bá-r(a)*, **a-ba-rá* ‘here’; (9) Common Abkhaz **a-ba-rá-ħa*, **a-bá-ħa-r(a)* ‘here’; (10) Common Abkhaz **a-ba-rá-śa* ‘thus, this way’; (11) Common Abkhaz **a-ba-rə́-jə* ‘this’; (12) Common Abkhaz **a-ba-wa-śa* ‘thus’; (13) Common Abkhaz **a-ba-wə́-jə* ‘this’; (14) Common Abkhaz **a-ba-wá-t(ə)* ‘these’.

24. Proto-Indo-European demonstrative stem **ʔeno-/*ʔono* (< **ʔe-+-no-/*ʔo-+-no-*) **ne-/*no-* ‘this, that’ (**ʔ* = **ḫ₁*): Sanskrit (instr. sg.) (m./n.) *anéna*, (f.) *anáyā* ‘this, that’; Avestan *ana-* demonstrative pronoun; Latin (conj.) *enim* ‘for; truly, certainly; but then’; Old Icelandic *enn*, *en*, *et* ‘the’, *inn*, *in*, *it* ‘the’, *hinn*, *hin*, *hit* (< **kʰe-+*ʔeno-*) ‘the’ (also demonstrative pronoun ‘that; the former, farther, the other’); Armenian *na* ‘that; he, she, it; him, her’, *-n* definite article; Lithuanian *anàs* ‘that’; Old Church Slavic *onъ* ‘he, she, it’; Hittite (nom. sg.) *an-ni-iš* ‘that’.

Northwest Caucasian:

A. Abkhaz: (1) Common Abkhaz **a-ná* ‘there’; (2) Common Abkhaz **a-nə́-y(ə)* ‘that’; (3) Common Abkhaz *á-na-tə*, *a-ná-tə* ‘those, they’; (4) Common Abkhaz *á-na-śa*, *a-ná-śa* ‘thus, that way’; (5) Common Abkhaz **an-ħa* ‘there, thither’; (6) Common Abkhaz **a-ma-nə́-jə* ‘that’ (**a-ma-ná* plus deictic **jə*); (7) Common Abkhaz *a-də́-na* ‘something, this, that’ (combination of deictics **a*, **də*, **na*); (8) Common Abkhaz **a-má-na-t(ə)* ‘those’ (**a-ma-ná* plus plural **-tə*); (9) Common Abkhaz **a-ma-ná* ‘there’ (combination of deictics **a*, **ma*, **na*).

B. Ubykh *ana-* pronominal stem found in several isolated forms, such as *anán* ‘there’. Also, *na:-* pronominal prefix of the 3rd person plural: ‘they’.

25. Proto-Indo-European **ʔyo-* relative pronoun stem (**ʔ* = **ḫ₁*): Greek ὅς, ἥ, ὅ ‘which’; Phrygian ιος ‘which; this’; Sanskrit *yá-ḥ* ‘which’.

    Northwest Caucasian:
    A. Common Abkhaz **ja-* demonstrative and relative/interrogative stem in: (1) Common Abkhaz **ja(-rá)* ‘he (male/human); it (non-human); this, the very same’: Abaza/Tapanta *ja-rá* ‘he; it; this, the very same’; South Abkhaz *ja-rá* ‘he (male/human); it (non-human); this, the very same’; Ashkharywa *ja-rá* ‘he; it; this, the very same’. (2) Common Abkhaz **ja-wá(-ja)* ‘why?’: Bzyp *jawá(j)* ‘why?’; Abaza/Tapanta *jawá* ‘why?’. (3) Common Abkhaz **j-an-b-ák’ºə* ‘when?’: Bzyp *j-an-bə-k’º* ‘when?’; Abaza/Tapanta *j-an-b-ák’ºə-w* ‘when?’.
    B. Ubykh *-y* enclitic particle in interrogative sentences (cf. *š'ə́-y?* ‘who?’, *waná sá:k'a-y?* ‘what is this?’, etc.). Also *ya-*, *ya:-* verbal prefix of the 3rd person, *yə-* proximate pronoun prefix, *yəná* proximate pronoun.

26. Proto-Indo-European **dʰe-* deictic particle — only preserved as a deictic suffix in the daughter languages (identical to the following entry): Sanskrit *-dha-* in *ádha*, *ádhā* (< **ʔe-dʰe-*) ‘now; then, therefore; moreover, so much the more; and, partly’; Gāthā Avestan *adā* ‘then, so’; Old Persian *ada-* ‘then’; Greek -θε(ν) in, for example, πρόσ-θεν (poetic πρόσ-θε) (Doric and Aeolic πρόσ-θα) ‘before, in front’, ὄπισ-θεν (also ὄπισ-θε) (poetic ὄπι-θεν) ‘behind, at the back’ (for more information, cf. Lejeune 1939).

    Northwest Caucasian:
    A. Proto-Circassian (reduplicated) **d(a)da* ‘very, just, exactly’: Bžedux *dada* ‘very, just, exactly’; Kabardian *dəda* ‘very, just, exactly’.
    B. Ubykh *dá* ‘now’.

27. Proto-Indo-European **dʰe-* deictic particle — only preserved as a deictic suffix in the daughter languages (identical to the preceding entry): Sanskrit *ihá* (< **ʔi-dʰe-*) ‘here’, *kúha* ‘where?’ (< **kʷʰu-dʰe*); Pāḷi *idha* ‘here’; Avestan *iδa* ‘here’; Old Persian *idā* ‘here’; Greek ἰθᾱ- in, for example, ἰθᾱ-γενής (Epigraphic ἰθαι-γενής) ‘born from a lawful marriage; aboriginal, indigenous’ (that is, ‘born here’), -θα/-θεν in ἔν-θα ‘there, then; where, when’, ἔν-θεν ‘thence, thereupon, thereafter; whence’; (?) Latin *ibī* (< **ʔi-dʰey*) ‘there’, *ubī* (< **kʷʰu-dʰey*) ‘where’; Old Church Slavic (adv.) *kъde* (< **kʷʰu-dʰe*) ‘where’. Note: The Latin forms could also be from **ʔi-bʰey* and **kʷʰu-bʰey*, respectively.

    Northwest Caucasian: Common Abkhaz **da(-rá)* ‘they’: South Abkhaz *da(-rá)* ‘they’; Ashkharywa *da(-rá)* ‘they’; Abaza/Tapanta *da(-rá)* ‘they’; Sadz *da-rá* // *da-r* ‘they’. Note: According to Hewitt (2005:104, §3.3), “Only Abkh-Aba has a full set of personal pronouns, for the sister-languages employ one of their demonstratives (usually 3rd person deictic) in the 3rd person.”

28. Proto-Indo-European **mo-* demonstrative stem (only attested in relic forms in Brittonic Celtic): Welsh *ýma* (poetical *ýman*) 'here'; Breton *ama*, *amañ*, *-ma*, *-mañ* 'here', (Vannetais) *ama*, *amann*, *amenn* 'here'; Cornish *yma*, *omma*, *-ma*, *-man* 'here'.

    Northwest Caucasian: Proto-Circassian **mə* 'this': Kabardian *mə* 'this'; Bžedux *mə* 'this'.

29. Proto-Indo-European **so-* demonstrative pronoun stem: 'this, that': Avestan *ha-* demonstrative pronoun stem; Sanskrit *sá-ḥ*, (f.) *sā* (also *sī*) demonstrative pronoun; Greek ὁ, (f.) ἡ demonstrative pronoun and definite article; Old Latin (m. singular) *sum* 'him', (f. singular) *sam* 'her', (m. plural) *sōs*, (f. plural) *sās* 'them'; Gothic *sa*, (f.) *sō* (also *si*) 'this, that; he, she'; Old Icelandic *sá*, *sú* 'that'; Old English *sē̆* 'that one, he', (f.) *sēo* 'she'; Dutch *zij* 'she'; Old High German (f.) *sī̆*, *siu* 'she' (New High German *sie*); Hittite *ša* connective particle, *-še* 3rd person singular enclitic pronoun ; Tocharian A (m.) *sa-*, (f.) *sā-*, B (m.) *se(-)*, (f.) *sā(-)* demonstrative pronoun.

    Northwest Caucasian:
    A. Abkhaz: Adyghe *səd(ā)* interrogative pronoun: 'what?'.
    B. Ubykh *sá* interrogative pronoun: 'what?', *sá:k'a* interrogative pronoun: 'what?'.
    C. Circassian: Kabardian *sət* interrogative pronoun: 'what?'; Bžedux *śə-d* interrogative pronoun stem: 'what?'. Note: The origin of initial *ś-* in Bžedux *śə-d* is unknown.

30. Proto-Indo-European **we-*/**wŏ-* 'you' (dual and pl.): Sanskrit *vas* 'you' (acc. pl.), *vām* (acc.-dat.-gen. dual); Avestan *vā* 'you' (nom. dual), *vaēm* (nom. pl.), *vå̊* (encl. acc. pl.); Latin *vōs* 'you' (nom.-acc. pl.), *vestrum* (gen. pl.); Old Church Slavic *vy* 'you' (nom. pl.), *vasъ* (acc.-gen.-loc. pl.).

    Northwest Caucasian:
    A. Proto-Circassian **wa* 'you' (sg.): Bžedux *wa* 'you' (sg.); Kabardian *wa* 'you' (sg.).
    B. Common Abkhaz **wa(-rá)*: South Abkhaz *wa-rá* 'you' (male/human, non-human); Ashkharywa *wa-rá* 'you' (male/human, non-human); Abaza/Tapanta *wa-rá* 'you' (male/human, non-human).

31. Proto-Indo-European **wo-* in **ʔe-+-wo-*/**ʔo-+-wo-* demonstrative pronoun: 'that' (**ʔ* = **ḫ₁*): Sanskrit (gen. dual) *avóḥ* 'that'; Avestan *ava-* 'that, yonder'; Old Persian *ava-* 'that'; Old Church Slavic *ovъ* 'someone, someone else, other' (*ovъ…ovъ* 'the one…the other'); Old Czech *ov* 'that'; Polish *ów* 'that'; Serbo-Croatian *òvāj* 'that'; Bulgarian *óvi* 'that'.

Notes:

1. Derksen (2008:384) reconstructs Proto-Indo-European *h_2*eu-o-*, with initial *h_2-. However, I prefer to see the first component as the same found in (1) the Proto-Indo-European demonstrative pronoun *ʔ*e-*/*ʔ*o-, *ʔ*ey-*/*ʔ*oy-*/*ʔ*i-* 'this, that', (2) the Proto-Indo-European demonstrative pronoun *ʔ*eno-*/*ʔ*ono* (< *ʔ*e-+-no-*/*ʔ*o-+-no-*) 'this, that', and (3) the Proto-Indo-European demonstrative pronoun *ʔ*ob^{h}o-* (< *ʔ*o-+-b^{h}o-*) 'this, that'.
2. The Proto-Indo-European deictic stem *we-*/*wo-* may be preserved as a relic form in Tocharian B *wa* 'therefore, nevertheless' (unstressed). The underlying Tocharian B form is /wā/, with long vowel (cf. Adams 2013:624). For the semantics, note Common Abkhaz **wa-śa* 'thus, this way' (no. 3 below) and **a-wá-śa* 'thus, this way' (no. 4 below).
3. Proto-Indo-European *ʔ*e-+-wo-*/*ʔ*o-+-wo-* 'that' and Common Abkhaz **a-wa* 'that' (no. 2 below) are formed in exactly the same way.

Northwest Caucasian:

A. (1) Common Abkhaz **wa* 'there': South Abkhaz *wa* 'there'; Ashkharywa *wa* 'there'. (2) Common Abkhaz **a-wa* 'that' (deictics **a*, **wa*): Abaza/Tapanta *awa* 'that'. (3) Common Abkhaz **wa-śa* 'thus, this way' (deictic **wa*, instrumental suffix **-śa*): Bzyp *wəś* 'thus, this way'; Abzhywa *wəs* 'thus, this way'; Ashkharywa *wəsa* // *was* // *wəs* // *wasa* 'thus, this way'. (4) Common Abkhaz **a-wá-śa* 'thus, this way': Ashkharywa *awas* // *awəs(a)* 'thus, this way'; Abaza/Tapanta *awás(a)* 'thus, this way'; (5) Common Abkhaz **wa-q'a* 'thither, there' (**wa* 'this', **-q'a* directional postposition): South Abkhaz *wáq'a* 'thither, there'; Ashkharywa *wáq'a* 'thither, there'. (6) Common Abkhaz **a-wá-q'a* 'there': Ashkharywa *awaq'a* 'there'; Abaza/Tapanta *awáʔa* 'there'. (7) Common Abkhaz **wə-ba-rá* (**wa*, **ba*, **ra*): South Abkhaz *wəbrá* 'here'. (8) Common Abkhaz **wa-ħa* 'there' (**wa*, **ħa*): South Abkhaz *wáā* 'there'; Ashkharywa *waá* 'there'.
B. Ubykh *wa-* distant pronoun (always compounded with the following noun): 'that yonder', *waná* (**wa*, **na*) independent distant pronoun: 'that younder'.

III. Family Relationship, Kinship Terms

32. Proto-Indo-European *ʔ*ab^h-* 'father, forefather, man' (*ʔ* = *$ḫ_1$*): Gothic *aba* 'man, husband'; Old Icelandic *afi* 'grand-father, man'; Faroese *abbi* 'grand-father'; Old English personal names *Aba*, *Abba*, *Afa*.

Northwest Caucasian: Common Abkhaz **abá* 'father': South Abkhaz *ab* 'father'; Ashkharywa *ába* 'father'; Abaza/Tapanta *ába*/*abá* 'father'. Note also (1) **aba* 'father' in Common Abkhaz **aba-pśá* 'stepfather': Bzyb *áb-pśa*, *áabə-psa* 'stepfather'; Abzhywa *ab-psa* 'stepfather'; Ashkharywa *aba-psa* 'stepfather'; Abaza/Tapanta *aba-psá* 'stepfather'; (2) **ab(a)* 'father' in

Common Abkhaz **áb-qʷə́-nda* ‘brother-in-law’: Abzhywa *ábx̌ʷənda* ‘brother-in-law’; Bzyb *ábx̱ʷənda* (indef. sg. *bx̱̌ʷə́-nda-k’*) ‘brother-in-law’; Ashkharywa *ábqʷənda* ‘brother-in-law’; Abaza/Tapanta *abqʷə́nd* ‘brother-in-law’; (3) **ab(a)* ‘father’ in Common Abkhaz **áb-qʷa* ‘father-in-law’: Bzyb *ábx̱ʷa* ‘father-in-law’; Abzhywa *ábx̌ʷa* ‘father-in-law’; Ashkharywa *ábqʷa* ‘father-in-law’; Abaza/Tapanta *ábqʷa* ‘father-in-law’; (4) **abá* ‘father’ in Common Abkhaz **ab-ja-š'á* ‘uncle (father’s brother)’ (< **abá* ‘father’, **ajaš'á* ‘brother’): South Abkhaz *áb-jaš'a* ‘uncle (father’s brother)’; Ashkharywa *ab-jaš'a* ‘uncle (father’s brother)’; Abaza/Tapanta *ab-aš'a* ‘uncle (father’s brother)’; (5) **abá* in Common Abkhaz **ab-ja-ħʷ-š'á* ‘aunt (father’s sister)’: South Abkhaz *áb-jaħʷš'a* ‘aunt (father’s sister)’; Ashkharywa *ab-ax̌š'a* ‘aunt (father’s sister)’; Abaza/Tapanta *ab-ax̌š'a* ‘aunt (father’s sister)’.

33. Proto-Indo-European **ʔan(n)o-s*, **ʔan(n)i-s*, **ʔan(n)a* ‘mother’ (**ʔ* = **h_1*) (also **na-na-* ‘mother’): Luwian (nom. sg.) *an-ni-iš*, *a-an-ni-iš* ‘mother’; Hittite (nom. sg.) *an-na-aš* ‘mother’; Palaic (nom. sg.) *an-na-aš* ‘mother’; Lycian (nom. sg.) *ẽni* ‘mother’; Lydian (nom. sg.) *ẽnaś* ‘mother’; Latin *anna* ‘foster-mother’; Greek (Hesychius) ἀννίς· ‘grand-mother’, νάννα, νάνναϛ ‘aunt’; Sanskrit *nanā́* familiar expression for ‘mother’.

Northwest Caucasian:

A. Proto-Circassian **n(a)* ‘mother’: Bždeduх *nə*, *yāna* ‘mother’, *nāna* ‘mamma, granny’; Kabardian *hana* ‘mother’, *nāna* ‘mamma, granny’.
B. Common Abkhaz **anə́*: South Abkhaz *an* ‘mother’; Ashkharywa *an* ‘mother’, (indef. sg.) *anə́-k’*; Abaza/Tapanta *anə* ‘mother’. Note also: (1) **anə́* ‘mother’ in Common Abkhaz **an-pśa* ‘stepmother’: Bzyp *án-pśa* ‘stepmother’; Sameba *ána-psa* ‘stepmother’; Ashkharywa *an-psa* ‘stepmother’; Abzhywa *án-psa* ‘stepmother’. (2) **anə́* ‘mother’ in Common Abkhaz **án-qʷa* ‘mother-in-law’: Bzyp *án-x̱̌ʷa* ‘mother-in-law’; Abaza/Tapanta *án-qʷa* ‘mother-in-law’; Ashkharywa *án-qʷa* ‘mother-in-law’; Abzhywa *án-x̌ʷa* ‘mother-in-law’. (3) **anə́* ‘mother’ in Common Abkhaz **án-qʷə-pħa* ‘sister-in-law’: Bzyp *án-x̱̌ʷ-pħa* ‘sister-in-law’; Ashkharywa *án-qʷə-pħa* ‘sister-in-law’; Abzhywa *án-x̌ʷ-pħa* ‘sister-in-law’. (4) **anə́* ‘mother’ in Common Abkhaz **an-š'á* ‘uncle’ (‘mother’s brother’): South Abkhaz *án-š'a* ‘uncle’ (‘mother’s brother’); Abaza/Tapanta (Gumlo[w]kt) *an-š'á* ‘uncle’ (‘mother’s brother’); Ashkharywa *an-š'a* ‘uncle’ (‘mother’s brother’). (5) **anə́* ‘mother’ in Common Abkhaz **an-ħʷš'á* ‘aunt’ (‘mother’s sister’): Ashkharywa *an-x̌š'a* ‘aunt’ (‘mother’s sister’); Abaza/Tapanta *án-x̌š'a* ‘aunt’ (‘mother’s sister’).
C. Ubykh *ná* (def. *ána*) ‘mother’.

34. Proto-Indo-European (reduplicated) **b^hā-b^hā-* (no laryngeals!) used to indicate various family relationships: ‘mommy, daddy, etc.’ (nursery word): Old Church Slavic *baba* ‘nurse’; Russian *bába* [баба] ‘mother, country woman, married peasant woman’; Czech *bába* ‘grandmother, midwife, old woman’;

Serbo-Croatian *bȁba* ‘grandmother, midwife, nurse, mother-in-law’; Lithuanian *bóba* ‘old woman’; Latvian *bãba* ‘old woman’; Middle High German *babe*, *bōbe* ‘old woman’ (Slavic loanwords), *buobe* ‘boy’. Note also Italian *babbo* ‘dad, daddy’.

Northwest Caucasian: Common Abkhaz **bába* used to indicate various family relationships: ‘mommy, daddy, etc.’ (nursery word): South Abkhaz *bába* ‘daddy’; Ahchypsy *bába* ‘daddy’; Ashkharywa *bəba* ‘mommy’.

35. Proto-Indo-European (reduplicated) **$d^hē$-$d^hē$-* (no laryngeals!) ‘older relative (male or female): grandfather, grandmother; uncle, aunt’ (nursery word): Greek τήθη ‘grandmother’, τηθίς ‘aunt’; Lithuanian *dẽdė*, *dẽdis* ‘uncle’; Old Church Slavic *dědъ* ‘grand-father’; Russian *ded* [дед] ‘grandfather’.

    Northwest Caucasian:
    A. Common Abkhaz **dada*: South Abkhaz *dad* ‘grandfather’, more rarely, ‘father’; Ashkharywa *dada* ‘father’; Abaza/Tapanta *dada* ‘grandfather, father’.
    B. Ubykh *dád* ‘father’.

36. Proto-Indo-European **k’en-*/**k’on-*/**k’$n̥$-* ‘to beget, to produce, to create, to bring forth’: Sanskrit *jánati* ‘to beget, to produce, to create; to assign, to procure’, *jánas-* ‘race’; Avestan *zan-* ‘to beget, to bear; to be born’, *zana-* ‘people’; Greek γίγνομαι ‘to be born’, γεννάω ‘to beget, to bring forth, to bear’, γένος ‘race, stock, kin’, γέννα ‘descent, birth’; Armenian *cnanim* ‘to beget’, *cin* ‘birth’; Latin *genō*, *gignō* ‘to beget, to bear, to bring forth’, *genus* ‘class, kind; birth, descent, origin’, *gēns*, *-tis* ‘clan; offspring, descendant; people, tribe, nation’; Old Irish *·gainethar* ‘to be born’, *gein* ‘birth’; Welsh *geni* ‘to give birth’; Gothic *kuni* ‘race, generation’; Old Icelandic *kyn* ‘kin, kindred; kind, sort, species; gender’, *kind* ‘race, kind’; Old English *cynn* ‘kind, species, variety; race, progeny; sex, (grammatical) gender’, *ge-cynd*, *cynd* ‘kind, species; nature, quality, manner; gender; origin, generation; offspring; genitals’, *cennan* ‘to bear (child), to produce’; Old Frisian *kinn*, *kenn* ‘race, generation; class, kind’; Old Saxon *kunni* ‘race, generation; class, kind’; Dutch *kunne* ‘race, generation’; Old High German *chunni* ‘race, generation’, *kind* ‘child; (pl.) children, offspring’ (New High German *Kind*).

    Northwest Caucasian: Proto-Circassian **k’(a)* ‘to come out, to bud, to grow’: Bždeduх *č’’ə* ‘to come out, to bud, to grow’; Kabardian *k’ə* ‘to come out, to bud, to grow’. Perhaps also: Proto-Circassian **k’a* ‘seeds’: Bždeduх *č’’a* ‘seeds’; Kabardian *k’a* ‘seeds’.

    Note: Proto-Indo-European **$n̥$* is reflected as **a* in Northwest Caucasian.

37. Proto-Indo-European **naneA* (> **nanā*) ‘mother’ (nursery word): Sanksrit *nanā́* familiar expression for ‘mother’; Greek νάννη ‘maternal aunt’, νάννα, νάννας ‘maternal or paternal uncle or aunt’; Welsh *nain* ‘grandmother’.

    Northwest Caucasian:
    A. Common Abkhaz **nana* ‘mother’ (nursery word): South Abkhaz *nan* ‘mama’, *nán(a)* form of address of the older woman to the younger person (inverted self-nomination); Abaza/Tapanta *nána*, *nə́na* ‘grandmother’.
    B. Ubykh (vocative) *nán(a)* ‘mother’ (nursery word).
    C. Proto-Circasian **nana* ‘mother; grandmother’ (nursery word): Bždedux *nāna* ‘mama’; Kabardian *nāna* ‘grandmother, granny’.

38. Proto-Indo-European **(s)nuso-s* ‘daughter-in-law’: Sanskrit *snuṣā́* ‘son’s wife, daughter-in-law’; Armenian *nu* ‘daughter-in-law’; Greek νυός ‘daughter-in-law; any female connected by marriage; wife, bride’; Albanian *nuse* ‘bride, (rarely) daughter-in-law’; Latin *nurus* ‘daughter-in-law; a young married woman’; Crimean Gothic *schuos* (misprint for **schnos*) ‘betrothed’; Old Icelandic *snør*, *snor* ‘daughter-in-law’; Old English *snoru* ‘daughter-in-law’; Old Frisian *snore* ‘daughter-in-law’; Middle Dutch *snoer*, *snorre* ‘daughter-in-law’; Old High German *snur*, *snor*, *snura*, *snuora* ‘daughter-in-law’; Serbian Church Slavic *snъxa* ‘daughter-in-law’; Russian *snoxá* [снoха] ‘daughter-in-law’; Serbo-Croatian *snàha* ‘daughter-in-law’.

    Northwest Caucasian:
    A. Proto-Circassian **nəsa* ‘(father’s) brother’s wife, daughter-in-law’: Adyghe *nəsa* ‘(father’s) brother’s wife, daughter-in-law’; Bždedux *nəsa* ‘(father’s) brother’s wife, daughter-in-law’; Kabardian *nəsa* ‘(father’s) brother’s wife, daughter-in-law’.
    B. Ubykh *nəsáɣ* (def. *ánsaɣ*) ‘(father’s) brother’s wife, daughter-in-law’..

    Notes:
    1. Proto-Indo-European **u* is reflected as **ə* in Northwest Caucasian.
    2. Also found in Northeast Caucasian and Kartvelian:
        A. Northeast Caucasian: Avar, Batsbi, Chechen, Ingush *nus* ‘daughter-in-law’; Andi *nusa* ‘daughter-in-law’; Tindi *nus(a)* ‘daughter-in-law’; Ghodberi *nuse-j* ‘daughter-in-law’; Karta *nusa* ‘daughter-in-law’; etc.
        B. Kartvelian: Mingrelian *nisa*, *nosa* ‘daughter-in-law’; Laz *nusa*, *nisa* ‘daughter-in-law’.
        C. According to Tuite—Schulze (1998), the Caucasian forms are loan-words from Indo-European.

39. Proto-Indo-European **pʰehs-o-s* [**pʰahs-o-s*] (> **pʰās-o-s*) ‘relative by marriage’ (**h* = **$_2$*) (only in Greek [cf. Beekes 2010.II:1187]): Greek πηός (Doric πᾱ́ος) ‘relative by marriage’.

Northwest Caucasian:

A. (?) Proto-Circassian **Pśaśa* ‘girl, maiden’: Bždedux *pśāśa* ‘girl, maiden’; Kabardian *pśāśa* ‘girl, maiden’. Note: Kuipers (1976:28) writes **Pşaşa*.
B. Common Abkhaz **pśa* ‘step-, relative by marriage’: Bzyp *án-pśa* ‘stepmother’, *áb-pśa* ‘stepfather’, *a-pa-pśá* ‘stepson’, *a-pħa-pśá* ‘step-daughter’; Abaza/Tapanta *an-psá* ‘stepmother’, *pħa-psá* ‘stepdaughter’, *ab-psá* ‘stepfather’, *pa-psá* ‘stepson’; Ashkharywa *a-pħa-psa* ‘step-daughter’, *a-pa-psa* ‘stepson’; Abzhywa *a-pa-psa* ‘stepson’.

Note: Proto-Indo-European **p^{h}Vhs-* = Northwest Caucasian **pśV*.

40. Proto-Indo-European **p^{h}eh-u/w-* [**p^{h}ah-u/w-*]/**p^{h}oh-u/w-* ‘little, small; little one, child’ (**h* = **ə$_4$*): Greek παῖς (gen. παιδός [< **παϝ-ι-δ-*]) ‘child’, (Attic) (Epigraphic) παῦς ‘child’, παῦρος (< **p^{h}eh-u-ro-* [**p^{h}ah-u-ro-*]) ‘little, small’; Latin *paucus* (< **p^{h}eh-u-k^{h}o-* [**p^{h}ah-u-k^{h}o-*]) ‘few’, *pauper* ‘poor’, *paul(l)us* ‘little, small (in size or quantity)’; Gothic *fawai* ‘few’; Old Icelandic *fár* ‘few’; Old English *fēa* (pl. *fēawe*) ‘(adj.) few, not many; (adv.) (not) even a little’.

Northwest Caucasian: (1) Common Abkhaz **pa* ‘son’: South Abkhaz *a-pá* ‘son’; Abaza/Tapanta *pa* ‘son’. (2) Common Abkhaz **pa* in **pa-pśa*: Bzyp *a-pa-pśá* ‘stepson’; Abzhywa *a-pa-psa* ‘stepson’; Ashkharywa *a-pa-psa* ‘stepson’; Abaza/Tapanta *pa-psá* ‘stepson’. (3) Common Abkhaz **pa* in **pa-j-pħá* (**pa* ‘son’ + **jə-* ‘his’ + **pħa* ‘daughter’): Ashkharywa *a-pə-j-pħa* ‘granddaughter’; Bzyp *a-pa-j-pá* ‘granddaughter’. (4) Common Abkhaz **pa* in **pa-j-pá*: Ashkharywa *a-pə-j-pa* ‘grandson’; Bzyp *a-pa-j-pá* ‘grandson’.

41. Proto-Indo-European **sew(H)-/*sow(H)-/*su(H)-* ‘to give birth’: Sanskrit *sū́te*, *sūyate* ‘to beget, to procreate, to bring forth, to bear, to produce, to yield’, *suta-ḥ* ‘son, child’, *sūtí-ḥ* ‘birth, production’, *sūnú-ḥ* ‘son, child, offspring’; Avestan *hunu-š* ‘son’; Greek υἱύς, υἱός ‘son’; Old Irish *suth* ‘offspring’; Gothic *sunus* ‘son’; Old Icelandic *sunr*, *sonr* ‘son’; Old English *sunu* ‘son’; Old Saxon *sunu* ‘son’; Old High German *sunu* ‘son’; Lithuanian *sūnùs* ‘son’; Old Church Slavic *synъ* ‘son’; Russian *syn* [сын] ‘son’; Tocharian A *se*, B *soy* ‘son’.

Northwest Caucasian: Proto-Circassian **śawa* ‘youth’: Bždedux *śāwa* ‘youth, especially bridegroom’; Kabardian *śāwa* ‘youth, especially bridegroom’; Temirgoy also ‘son’. Note: Kuipers (1975:32) writes **şawa*.

42. Proto-Indo-European (reduplicated) **t^{h}ă-t^{h}a-* ‘father’ (nursery word): Sanskrit *tatá-ḥ* ‘father’, *tāta-ḥ* ‘father’ (a term of affection or endearment addressed to any person); Latin *tata* ‘father, daddy; grandfather, grandpa’; Greek τατᾶ ‘daddy’, τέττα ‘father’ (a term of respect addressed by youths to their elders); Cornish *tat* ‘father’; Albanian *tatë* ‘father, daddy’; Russian *t'át'a* [тятя] ‘dad, daddy’.

Northwest Caucasian: Proto-Circassian *t:(a) ‘father, daddy’: Bždedux *t:ə*, *yāt:a* ‘father’, *t:āt:a* ‘daddy; grandpa’ (term of address); Kabardian *hada* ‘father’, *dada* ‘daddy; grandpa’ (term of address).

43. Proto-Indo-European *t^hek^h- ‘(vb.) to beget; (n.) offspring’: Sanskrit *tákman-* ‘offspring’; Greek τέκνον ‘child’, τίκτω (< Pre-Greek **ti-tk-é-*) ‘to beget, to bring forth’, τόκος ‘childbirth; offspring’.

    Northwest Caucasian: Common Abkhaz *taqə́ ‘close relative’: Bzyp *a-taχ̌ə́* ‘close relative’; Abzhywa *a-taχ̌ə́* ‘close relative’.

44. Proto-Indo-European **yenH-t^her-*/**yn̥H-t^her-* ‘female in-law by marriage: sister-in-law, husband’s brother’s wife’: Sanskrit *yātar-* ‘husband’s brother’s wife’; Greek (f.) ἐνάτηρ ‘husband’s brother’s wife’, (Homeric) (pl.) εἰνατέρες ‘wives of brothers or of husband’s brothers, sisters-in-law’; Latin (pl.) *ianitricēs* ‘wives of brothers’; Old Lithuanian *jéntė* ‘husband’s brother’s wife’; Old Church Slavic *jętry* ‘husband’s brother’s wife’.

    Northwest Caucasian: Common Abkhaz *jə́nə ‘female (of animals): Abzhywa *a-jə́n* ‘female (of animals)’.

IV. Mankind

45. Proto-Indo-European *ʔer-s-/*ʔr̥-s- ‘male, man’ (*ʔ = *$ḫ_1$): Greek (Homeric) ἄρσην, (Attic) ἄρρην, (Ionic, Aeolian, Lesbian, Cretan, etc.) ἔρσην, Laconian ἄρσης ‘male; masculine, strong’; Sanskrit *ṛṣa-bhá-ḥ* ‘bull’; Avestan *aršan-* ‘man; manly’; Old Persian *aršan-*, *arša-* ‘male, hero, bull’; Armenian *arn* ‘male sheep’.

    Northwest Caucasian: Common Abkhaz *arpə́ ‘youth, young man’: Bzyp *árpə-ś* // *árpa-ś* ‘youth, young man’ (indef. sg. *arpə-s-k’*; *rpə́-śa-k’*) (pl. *árpa-r(a)*). (*-śə* = diminutive suffix.) Also in the meaning ‘time of youth’: *jəpaćºa* <…> *arpara naʒanə ajvagəlan* ‘his sons, having reached the age of youth, stood by each other’.

46. Proto-Indo-European *ʔoy- ‘single, alone, solitary; one’ (with non-apophonic *-o-*) (extended forms: (1) *ʔoy-no-, (2) *ʔoy-wo-, (3) *ʔoy-k^ho-) (*ʔ = *$ḫ_1$):

    1. *ʔoy-no-: Latin *ūnus* ‘one’ [Old Latin *oinos*]; Old Irish *óen*, *óin* ‘one’; Gothic *ains* ‘one’; Old Icelandic *einn* ‘one’; Old English *ān* ‘one; alone, sole, lonely; singular, unique’; Old Saxon *ēn* ‘one’; Old High German *ein* ‘one’; Lithuanian *vienas* (with unexplained initial *v-*) ‘one; alone’; Old Prussian *ains* ‘one’; Old Church Slavic *inъ* ‘some(one), other’; Russian Church Slavic *inokyj* ‘only, sole, solitary’; Russian *inój* [иной] ‘different, other’ — it is also found in Greek οἴνη, οἰνός ‘roll of one (in dice)’.

2. *ʔoy-wo-: Avestan *aēva-* ‘one’; Old Persian *aiva-* ‘one’ — it is also found in Greek οἶος ‘alone, lone, lonely’ (Cyprian οἰϜος).
3. *ʔoy-kʰo-: Sanskrit *éka-ḥ* ‘one’; Mitanni (“Proto-Indic”) *aika-* ‘one’.

Northwest Caucasian:

A. Common Abkhaz **ajə́ba* ‘orphan’: Abzhywa *ájba* ‘orphan’; Bzyp *áajba* (indef. sg. *ajbá-k’*), *ajbá* ‘orphan’; Abaza/Tapanta *jə́ba* (indef. sg. *jə́ba-k’*) ‘orphan’. In South Abkhaz, also ‘widow’.
B, Ubykh *ay-* in *áyda*, *aydáx* ‘that one, the other one’.

47. Proto-Indo-European **men-*/**mon-*/**mn̥-* ‘alone, only; few, scanty’: Greek μόνος (Ionic μοῦνος; Doric μῶνος) (< *μόνϜος) ‘alone, only’, μᾱνός (Attic μᾰνός) (< *μανϜός) ‘thin, loose, slack; few, scanty’; Armenian *manr* ‘small, thin’; Sanskrit *manắk* ‘a little, slightly’. Perhaps also: Lithuanian *meñkas* ‘small, slight, insignificant, poor, weak’; Old High German *mengen*, *mangolōn* ‘to be without, to lack, to miss’ (New High German *mangeln*); Middle High German *manc* ‘lack’; Tocharian B *mäṅk-* ‘to be deprived of, to suffer the loss of, to lack’, *meṅki* ‘lack, deficit, shortage; fault, error’.

Northwest Caucasian:

A. (1) Common Abkhaz **macá* ‘only, just, single’: South Abkhaz *á-maca-ra* ‘only, just single’; Ashkharywa *maca(-ra)* ‘only, just, single’; Abaza/Tapanta *mc(ə)ra* ‘empty’. (2) Common Abkhaz **malá* ‘uselessly; alone, by oneself’: South Abkhaz *a-malá* ‘for free, uselessly’, *á-mala* ‘uselessly; alone, by oneself’; Feria (Sameba) *á-mala-x̌a* ‘for free, uselessly’.
B. Ubykh *macáq’a:la* ‘in vain, uselessly’.

Note: Proto-Indo-European **n̥* is reflected as **a* in Northwest Caucasian.

48. Proto-Indo-European **hepʰ-elo-* [**hapʰ-elo-*] ‘strength, power’ (**h* = **ə₄*): Greek (Hesych.) (*ἄπελος ‘strength’ >) ἀν-απελάσας· ἀναρρωσθείς ‘weakness’; Old Icelandic *afl* ‘strength, power, might’, *efla* ‘to strengthen’, *efling* ‘growth, increase in strength and wealth’; Faroese *alv*, *alvi* ‘strength, power’; Norwegian (dial.) *avl* ‘physical strength’; Swedish *avel* ‘strength’; Old English *afol* ‘power, might’; Old Saxon *aƀal* ‘power’.

Northwest Caucasian: Common Abkhaz **ápš’ə* ‘big, strong, powerful’: South Abkhaz *abax̌ᵒ-apš′* ‘the strong rock’, *azaar(*a)-apš′* ‘terrible anger’, *a-k’aamet-apš′* ‘horror, doomsday’, *agaʒ(*a)-apš′* ‘bally idiot’, *adaw(*ə)-apš′* ‘monstrous giant’, *á-mat-apš′* ‘a very venomous snake’; Abaza/Tapanta *q’abard-ápš′*/*q’abárd-apš′* ‘the Great Kabarda’.

49. Proto-Indo-European **men-*/**mon-*/**mn̥-* ‘(vb.) to desire passionately, to yearn for; (n.) ardent desire, passion, lust’: Tocharian B *mañu* ‘desire’, A *mnu* ‘spirit, appreciation, desire’; Sanskrit *man-* (RV) ‘to hope or wish for’ (also ‘to think’),

mánas- ‘spirit, passion’ (also ‘mind, intellect, perception, sense’), *manasyú-* (RV) ‘wishing, desiring’, *manā́* (RV) ‘devotion, attachment, zeal, eagerness’, *manīṣita-* (MBh) ‘desired, wished (for); desire, wish’, *manyú-* (RV) ‘high spirit or temper, ardor, zeal, passion’; Greek μενεαίνω ‘to desire earnestly or eagerly’, μένος ‘spirit, passion’, μέμονα (perfect used as present) ‘to desire or wish eagerly, to yearn for, to strive for’, μενοινή ‘eager desire’, μενοινάω ‘to desire eagerly’; Old Irish *menn-* ‘to desire’, *menme* ‘feeling, desire’ (also ‘mind, intelligence’); Old Icelandic *muna* ‘to like, to long for’, *munaðr* ‘delight’, *munr* ‘love’, *munuð* or *munúð* ‘pleasure, lust’; Old English *myne* ‘desire, love, affection’ (also ‘memory’), *mynle* ‘desire’, *mynelic* ‘desirable’; Old Frisian *minne* ‘love’; Old Saxon *minnea*, *minnia* ‘love’; Old High German *minna* ‘love’, *minnōn*, *minneōn* ‘to love’. Proto-Indo-European **manu-s* ‘man, begetter, progenitor’: Avestan *manuš-* ‘man, person’ in *Manuš-čiθra-*; Sanskrit *mánu-ḥ* ‘man, mankind, father of men’; Gothic *manna* ‘man, person’; Old Icelandic *mannr* ‘man, human being’; Old English *mann* ‘man, human being’; Old Frisian *mann*, *monn* ‘man’; Old Saxon *mann* ‘man’; Old High German *man(n)* ‘man’; Old Church Slavic *mǫžь* ‘man’.

Northwest Caucasian: Proto-Circassian **mana* ‘penis’: Bždeux *māna* ‘penis’; Kabardian *māna* ‘penis’.

50. Proto-Indo-European **p^{h}ĕ(y/i)-* ‘to hurt, to harm, to attack’: Gothic *fijands* ‘enemy’; Old Icelandic *fjándi* ‘enemy, foe’; Old English *fēonds* ‘enemy’.

    Northwest Caucasian: Proto-Circassian **p:əyə* ‘enemy’ (/p:/ = unaspirated /p/): Bždeux *p:əyə* ‘enemy’; Kabardian *bəy* ‘enemy’.

51. Proto-Indo-European **p^{h}ot^{h}-i-* ‘one who is strong, powerful, able, capable, master of’: Sanskrit *páti-ḥ* ‘master, owner, possessor, lord, ruler, governor, sovereign; husband’; Greek πόσις ‘husband’; Latin *potis* ‘able, capable’, *potior* ‘to get, to obtain, to gain possession of; to possess, to have, to be master of’; Gothic *-faþs* in *bruþ-faþs* ‘bridegroom’; Old Lithuanian *patìs* ‘oneself, himself, itself’; Tocharian A *pats*, B *pets* ‘husband’.

    Northwest Caucasian: Proto-Circassian **p:ət:a* ‘strong, solid’: Bždeux *p:ət:a* ‘strong, solid’; Kabardian *bəda* ‘strong, solid; stingy’.

V. Parts of the Body; Bodily Functions

52. Proto-Indo-European **b^{h}r-uH-* (> **b^{h}rū-*) ‘eyelash, eyebrow’: Sanskrit *bhrū́-ḥ* ‘an eyebrow, the brow’; Greek ὀ-φρῦς ‘the brow, eyebrow’; Middle Irish (gen. dual) *brúad* ‘eyebrow’; Old Icelandic *brún* (< **b^{h}ruwōn-*) (pl. *brynn*) ‘eyebrow’; Old English *brū* ‘eyebrow; eyelid, eyelash’; Lithuanian *bruvìs* ‘eyebrow’; Old Church Slavic *brъvь* ‘eyebrow’; Russian *brov′* [бровь] ‘eyebrow’; Tocharian A *pärwān-*, B (dual) *pärwāne* ‘eyebrows’.

Northwest Caucasian: Common Abkhaz **bra* ‘mane; hair’: Bzyp *á-bra* ‘mane (of a horse)’, *a-brá-š* ‘tow-haired’; Abaza/Tapanta *bra* ‘plait, braid; hair (arch.)’, *qa-brá* ‘hair’ (*qa* ‘head’).

53. Proto-Indo-European (reduplicated) **$d^hud^hd^h$-o-* ‘nipple’ (> ‘anything having the size or shape of a nipple: lump, knot, dot, etc.’): Late Latin *dudda* ‘nurse, nanny’ (loan from unknown source); Old High German *tutto*, *tutta* ‘nipple’ (New High German [dial.] *Tütte*); Middle High German (dim.) *tüttel* ‘nipple’ (New High German *Tüttel* ‘point, dot, jot’); Dutch *dot* ‘lump, small knot’; Old English *dott* ‘speck, head (of a boil)’; East Frisian *dotte*, *dot* ‘lump, clump’. Possibly also the following Greek forms: τυτθός ‘(of children) little, small, young’, (pl.) τυτθά (in Homeric only: τυτθὰ διατμήξας ‘cut small’), (adv.) τυτθόν ‘a little, a bit’, (Doric) τυννός ‘small, little’. Note: Elsewhere (volume 2, pp. 360—361, no. 302), I have proposed derivation of Proto-Indo-European **$d^hud^hd^h$-o-* ‘nipple’ from Proto-Nostratic (reduplicated) **ʒuʒ-a* (< **ʒu-ʒu-*) ‘tip, point’ (> ‘nipple, breast’).

Northwest Caucasian:

A. Common Abkhaz **ʒə́ʒa* ‘woman’s/mother’s breast’: Abzhywa *a-ʒə́ʒ*, *a-ʒə́ʒ (-kºa)* (*-kºa* = plural suffix) ‘woman’s/mother’s breast’; Ahchypsy *a-ʒə́ʒ-kºa* ‘woman’s/ mother’s breast’; Gumlo(w)kt (2) *ʒə́ʒa* ‘woman’s/mother’s breast’. Perhaps influenced by or borrowed from Kartvelian: cf. Georgian *ʒuʒu-* ‘breast (female)’.
B. Proto-Circassian **bəʒə* ‘woman’s breast’: Bždedux *bəʒə* ‘woman’s breast’; Kabardian *bəʒ* ‘woman’s breast’. Perhaps dissimilated from **ʒəʒə*.
C. Ubykh *bə́ʒ* ‘breast, nipple’.

Notes:

1. Proto-Indo-European **u* is reflected as **ə* in Northwest Caucasian.
2. Northwest Caucasian **ʒ* = Proto-Indo-European **d^h*.

54. Proto-Indo-European (reduplicated) **k^ha-k^ha-* ‘to laugh’ (onomatopoeic): Greek καχάζω ‘to laugh aloud; to jerr, to mock’; Armenian *xaxank* ‘laughter’; Sanskrit *kákhati*, *khákkhati* ‘to laugh, to laugh at or deride’; Latin *cachinnō* ‘to laugh, especially loudly or boisterously’; Old English *ceahhetan* ‘to laugh loudly’; Old High German *kachazzen*, *kichazzen* ‘to laugh loudly’; Old Church Slavic *xoxotati* ‘to laugh loudly’.

Northwest Caucasian: Proto-Circassian **k^hak^ha* ‘to laugh’: Temirgoy *č'ač'a-n* ‘to chirr, to laugh derisively; to bleat, to howl, to shout’; Kabardian *kāka* ‘to chirr, to laugh derisively; to bleat, to howl, to shout’.

55. (1) Proto-Indo-European (**k'en-*/**k'on-*/)**k'n-* ‘knuckle-bone’: Old Icelandic *knúta* ‘knuckle-bone, joint-bone, head of a bone’, *knúi* ‘a knuckle’; Middle English *cnokil* ‘knuckle’; Middle Low German *knoke* ‘bone’. (2) Proto-Indo-

European **k'en-u-*, **k'n-ew-* 'knee, joint, angle': Hittite *ge-e-nu* 'knee'; Sanskrit *jā́nu* 'knee'; Latin *genū* 'knee, knot, joint'; Greek γόνυ 'knee, joint'; Gothic *kniu* 'knee'; Old Icelandic *kné* 'knee'; Old English *cnēow* 'knee'; Old Saxon *knio* 'knee'; Old High German *kneo* 'knee'.

Northwest Caucasian: Proto-Circassian **k'anə* 'knuckle-bone (used in bone game)': Bžedux *č''anə* 'knuckle-bone (used in bone game)'; Kabardian *k'an* 'knuckle-bone (used in bone game)'.

56. Proto-Indo-European **men-/*mon-/*mn̥-* 'hand': Latin *manus* 'hand'; Hittite (3rd sg. pres. act.) *ma-ni-ya-aḫ-ḫi* 'to distribute, to entrust (with dat.); to hand over; to show; to govern'; Old Icelandic *mund* 'hand'; Old English *mund* 'hand, palm'; Old High German *munt* 'hand; protection'.

    Northwest Caucasian: Common Abkhaz **ma* 'hand' in (this is but a sampling): (1) Common Abkhaz **ma-p'ºə́*: South Abkhaz *a-nap'ə́* 'hand'; Ashkharywa *mp'ºə* 'hand'; Abaza/Tapanta *nap'ə́* 'hand'. (2) Common Abkhaz **ma-tá*: South Abkhaz *á-mta* 'handle', (indef. sg.) *matá-k'* 'handle'. (3) Common Abkhaz **ma-č'á*: Bzyp *a-mač'á* 'palm, span'; Abzhywa *á-mač'a* 'palm, span'. (4) Common Abkhaz **ma-x̌ºá*: South Abkhaz *a-ma-x̌ºá-r* 'arm'; Ashkharywa *max̌ºá* 'arm'. (5) Common Abkhaz **ma-ḥá*: South Abkhaz *á-maa* 'handle'; Abaza/Tapanta *mḥa* 'handle'.

    Note: Proto-Indo-European **n̥* is reflected as **a* in Northwest Caucasian.

57. Proto-Indo-European (**neb^{h}-/)*nob^{h}-* 'navel': Sanskrit *nā́bhi-ḥ* 'navel'; Old High German *naba* 'nave, hub (of a wheel)'; Old Prussian *nabis* 'navel'.

    Northwest Caucasian: Proto-Circassian **nəba* 'belly': Bžedux *nəba* 'belly'; Kabardian *nəba* 'belly'. Note also: Temirgoy *nəbəǯ'ə* 'navel'; Kabardian *bənža* 'navel'; Abaza/Tapanta *bənʒ'a* 'navel'; Ubykh *nəbəǯ'* 'navel'.

58. Proto-Indo-European (extended form) **p^{h}eh-s-* [**p^{h}ah-s-*] (> **p^{h}ās-*) 'to puff, to blow; to reek (of), to smell (of)' (only in Slavic) (**h* = **ə$_{4}$*): Russian *paxnút'* [пахнуть] 'to puff, to blow', *páxnut'* [пахнуть] 'to smell (of), to reek (of)'; Czech *páchnouti* 'to be fragrant'; Polish *pachnąć* 'to smell (of)'. Perhaps also: Proto-Indo-European (extended form) **p^{h}eh-k'-* [**p^{h}ah-k'-*] (> **p^{h}āk'-*) 'face, surface' (only in Indo-Iranian) (**h* = **ə$_{4}$*): Sanskrit *pā́ja-ḥ* 'face, surface'; Khotan Saka *pāysa-* 'surface'.

    Northwest Caucasian:

    A. (1) Proto-Circassian **p^{h}a* 'nose, front': Bžedux *p^{h}a* 'nose, front, beginning, etc.'; Kabardian *pa* 'nose, front, beginning, etc.' (2) Proto-Circassian **p^{h}aPλa* 'red-nosed'; (3) Proto-Circassian **p^{h}ax^{º}ə* 'white-nosed'; (4) Proto-Circassian **p^{h}aq:a* 'snub-nosed'; (5) Proto-Circassian

p^haPĝə ‘bridge of nose’; (6) Proto-Circassian *p^ham(ə)* ‘to smell (something)’; etc.

B. Common Abkhaz *pə* ‘nose’, in: (1) Common Abkhaz *pə-n-ć’a* (< *pə ‘nose’, *-n-* locative, *ć’a* ‘sharp’): Abzhywa *a-pə́nc’a* ‘nose’; Ashkharywa *a-pə́nc’a* ‘nose’; Bzyp *a-pə́nć’a* ‘nose’; Abaza/ Tapanta *pə́nc’a* ‘nose’. (2) Common Abkhaz *a+p-á+x̌'a* ‘earlier, previously, before’; (3) Common Abkhaz *a+pə* ‘before, at the front’; (4) Common Abkhaz *a+pə́-x̌'a* ‘earlier, previously, before’; (5) Common Abkhaz *á+pə-x̌'a* ‘at the front, earlier’; (6) Common Abkhaz *a+p+qá* ‘ahead, before, earlier’; (7) Common Abkhaz *p-á-ga* (< *p-a* ‘the first’, *ga* ‘to carry, to bring’) ‘to pass ahead, to beave behind, to forestall’; (8) Common Abkhaz *pə-bá* ‘smell, odor’; (9) Common Abkhaz *pə́-za* ‘to lead’; etc.

C. Ubykh *fa-* in *faċ’á* ‘nose, tip’.

59. Proto-Indo-European *p^hes-/*p^hos-, *p^hs-u-* ‘(vb.) to breathe, to blow; to live; (n.) breath, life, soul’: Sanskrit *psu-* in *ápsu-ḥ* ‘breathless’; Greek ψῡχή ‘breath, spirit, life; the soul or spirit of man’, ψύχω ‘to breathe, to blow’, ψύχωσις ‘giving life to, animating’, ψῡχήϊος ‘alive, living; having a ψῡχή’. Perhaps also Sanskrit (Vedic) *pastyà-m* ‘(neut.) habitation, abode, stall, stable; (masc. pl.) house, dwelling, residence; household, family’.

Northwest Caucasian:

A. (1) Proto-Circassian *Psa* ‘life, soul’: Bždedux *psa* ‘life, soul’; Kabardian *psa* ‘life, soul’. (2) Proto-Circassian *Psawə* ‘to live’: Kabardian *psaw* ‘to live; healthy, whole, all’; Bždedux *psawə* ‘to live’, *psāwə* ‘healthy’, *pst:awə* ‘whole, all’. Circassian loanwords in Abkhaz: South Abkhaz *psawátla* ‘living’; Bzyp *psawátla* ‘living’; Abaza/Tapanta *psawatla* ‘household; additional buildings on a farm’; Abzhywa *pswatla* ‘living’ (< Circassian *psa-wa-λa* ‘living, household’).

B. Common Abkhaz *psə*: South Abkhaz *a-psə́* ‘soul’, *a-psə́p* ‘respiration’, *a-psatá* ‘place where souls rest after death’, *a-ps-š'a-ra* ‘(to) rest’, *a-psə́č* ‘weak’; Bzyp *a-psə-n-ć’-rə́* ‘life-time’; Abaza/Tapanta *psə* ‘soul’, *psəp* ‘respiration’, *psatá* ‘place where souls rest after death’, *č-ps-š'a-ra* ‘(to) rest’; Abzhywa *a-psə-n-c’-rə́* ‘life-time’.

C. Ubykh *psá* ‘breath, soul, life’.

Note: Proto-Indo-European *p^hVs- = Northwest Caucasian *psV-.

60. Proto-Indo-European *ses-* ‘to sleep’: Hittite (3rd sg. pres. act.) *še-eš-zi* ‘to rest, to sleep, to spend the night, to stay (overnight); to go to sleep, to lie down’, (gen. sg.) *še-šu-wa-aš* ‘bedroom’, (acc. sg.) *ša-aš-ta-an* ‘sleep, bed’; Sanskrit *sásti* ‘to sleep, to be still’; Avestan *hah-* ‘to sleep’. Note: The original meaning may have been something like ‘(to be) drowsy, woozy, sleepy; to nod’.

Northwest Caucasian:

A. Common Abkhaz **səsə* ‘to sway, to shake, to tremble, to be sleepy’ (used with preverbs) (cf. Chirikba 1999:161, note 17; not in Chirikba 1996b).
B. (?) Ubykh *sa-* ‘to doze, to slumber’ (*səsán* ‘I doze, I slumber’).
C. Proto-Circassian **səsə* ‘to sway, to shake, to tremble’: Bždedux *səsə* ‘to sway, to shake, to tremble’; Kabardian *səs* ‘to sway, to shake, to tremble’.

VI. Medical Terms

61. Proto-Indo-European **$g^{w}{}^{h}$el(H)-uH* ‘tumor, swelling’ (only in Balto-Slavic): Proto-Slavic **žely* ‘tumor, fistula’ > Russian *želvák* [желвак] ‘tumor, swelling, lump’; Czech *žluva* ‘soft tumor (in horses)’; Polish (dial.) *żółwi* ‘abscess on the ear’; Slovenian *žệlva* ‘fistula’; Serbo-Croatian (Čakavian) *žëlva* ‘tumor’, *žọ̑lva* ‘scrofula’. Latvian *dzęlva* ‘(slight) swelling on the skin’. Note: Derksen (2015: 533) reconstructs Proto-Indo-European **g^{h}el(H)-uH-*.

    Northwest Caucasian; Common Abkhaz **g^{o}álə* ‘goiter, wen; clod’: South Abkhaz *a-g^{o}ál* ‘clod’; Abaza/Tapanta *g^{o}al* ‘goiter, wen’ (medical term).

62. Proto-Indo-European (extended form) **k’en-k’-/*k’on-k’-/*k’n̥-k’-* ‘growth, excrescence’: Greek γογγρώνη ‘an excrescence on the neck’, γόγγρος ‘an excrescence on trees’, γογγύλος ‘round’; Lithuanian *gùnga* ‘hunch, lump’.

    Northwest Caucasian: Common Abkhaz **k’an-(ć’ə)ć’ə́ra* ‘wart’: Ashkharywa *k’'anc’əra* ‘wart’; Abaza/Tapanta *c’ənk'ra* ‘wart; Bzyp *a-k’anć’əć’ə́r* ‘wart’; Abzhywa *a-k’anc’əc’ə́ra*, *a-k’anc’ac’ə́ra* ‘wart’.

63. Proto-Indo-European **t^{h}ep^{h}-/*t^{h}op^{h}-* ‘to be or become swollen, fat, large, great, high, thick’ (Tocharian only): Tocharian A *täp-* ‘to be or become high’, *tpär* ‘high’, (?) *tsopats* ‘great, large’; B *tapre* ‘high, fat’, *täprauñe* ‘height’.

    Notes:

    1. Derivation from Proto-Indo-European **d^{h}ub-ró-* ‘deep’ (cf. Adams 2013: 296—297; van Windekens 1976—1982.I:509) is not convincing (cf. Buck 1949:§12.31 high), though Tocharian A *top* ‘mine’, B *taupe* ‘mine’ do, indeed, go back to Proto-Indo-European **d^{h}oub-* ‘deep’ (the Proto-Indo-European reconstructions given by Adams and van Windekens have been retained here). Clearly, the underlying meanings implied by the Tocharian forms cited above are ‘swelling, growing, increasing, rising, etc.’, while ‘deep’ typically comes from notions such as ‘bottom, hollow, bent (downwards), etc.’ (cf. Buck 1949:§12.67 deep).
    2. A better comparison for the Tocharian forms may be with Old Icelandic *þefja* (*þafða*, *þafðr*) (< Proto-Germanic **þafjanan*) ‘to stir, to thicken’ (preserved only in the past participle: *hann hafði þá eigi þafðan sinn graut*

'he had not cooked his porridge thick') (for the semantics, cf. Buck 1949:§12.63 thick [in dimension] and §12.64 thick [in density]).

Northwest Caucasian: Common Abkhaz **tapre* 'fatty tumor, lipoma': South Abkhaz *a-tápta* 'fatty tumor, lipoma'.

VII. Animals

64. Proto-Indo-European **ʔebʰ-r-* (?) 'male of small hoofed animals' (**ʔ* = **ḫ₁*): Thracian ἔβρος· 'buck, he-goat' (ἔβρος· τράγος, βάτης· καὶ ποταμὸς Θρᾴκης). Proto-Germanic **eβuraz* 'wild boar' > Old Icelandic *jöfurr* 'wild boar; (metaphorically) king, warrior'; Old English *eofor*, *eofur* 'boar, wild boar'; Middle Dutch *ever* 'boar'; Old High German *ebur* 'wild boar'.

Notes:
1. The above forms are usually compared with somewhat similar forms in Italic and Balto-Slavic: (A) Italic: Latin *aper* 'wild boar'; Umbrian (acc. sg.) **abrunu** 'boar' (the Umbrian form refers specifically to domestic boars offered as a sacrifice). The Proto-Italic form was probably **apro-* or **aprōn-*. (B) Balto-Slavic: Latvian *vepris* 'castrated boar'; Old Church Slavic *veprъ* 'boar'; Russian *vepr'* [вепрь] 'wild boar'; Czech *vepř* 'pig'.
2. The attested forms have been remodeled in each of the daughter languages, making it difficult to reconstruct the Proto-Indo-European form.
3. For the semantic correlation between the Indo-European (Germanic) and Abkhaz forms, cf. Greek κάπρος 'boar, wild boar' ~ Latin *caper* 'he-goat, buck'; Old Icelandic *hafr* 'buck, he-goat'; Old English *hæfer* 'he-goat'.

Northwest Caucasian: Common Abkhaz **abə́* '(castrated) he-goat': South Abkhaz *ab* (indef. sg. *abə́-k'*) '(castrated) he-goat'; Ashkharywa *ab* '(castrated) he-goat'; Abaza/Tapanta *ab* '(castrated) he-goat'. Note also (1) **abə* 'he-goat' in Common Abkhaz **abə-z+nə́-žº* (< **abə* 'he-goat', **za-nə* 'one', **ažºə* 'old') 'male goat half a year old': South Abkhaz *abəznə́-žº* 'male goat half a year old'; (2) **abə* 'he-goat' in Common Abkhaz **ab-tºá* 'sheep wool clipped in spring': South Abkhaz *á-btºa* 'sheep wool clipped in spring'; Abaza/Tapanta *bčºa* 'sheep wool clipped in spring'; Gumlo(w)kt *bča* 'sheep wool clipped in spring'.

65. Proto-Indo-European (f.) **ʔegʰ-iH* 'cow': Sanskrit (f.) *ahī́* 'cow'; Avestan (adj. f.) *azī* 'cow who has had a calf, a milch cow'; Armenian *ezn* 'bullock, ox'.

Notes:
1. The masculine form is unattested, but it would probably have been something like Proto-Indo-European **ʔegʰ-o-* 'bull'.
2. Sanskrit (m.) *ághnya-ḥ*, *aghnyá-ḥ* 'bull' is not related to the above forms (cf. Mayrhofer 1956—1980.I:19).

Northwest Caucasian: Common Abkhaz **áɣ'a* ‘the male parent of an animal’: South Abkhaz *áɣ'a* ‘sire, house male animal or bird left for reproduction’; Bzyp (indef. sg.) *ɣ'a-k'*, *áɣ'a-k'*, *aɣ'á-k'* ‘sire, house male animal or bird left for reproduction’, *aɣ'á-s* ‘as a sire’.

Note: Common Abkhaz **ɣ'* = Proto-Indo-European **g^h*.

66. Proto-Indo-European **ʔey-/*ʔoy-* ‘multicolored, of variegated color’ (**ʔ* = **$ə_1$*): Sanskrit *éta-ḥ* ‘(adj.) shining, of variegated color; (n. m.) a kind of antelope’, (m.) *eṇa-ḥ*, (f.) *eṇī* ‘black antelope’, *énī* (f.) ‘a deer or antelope’, *étagva-ḥ* ‘of a variegated or dark color’, *étaśa-ḥ* ‘(adj.) of variegated color, shining; (n. m.) a horse of variegated color’; Old Prussian *aytegenis* ‘lesser spotted woodpecker’.

Northwest Caucasian: (1) Common Abkhaz **aja* ‘dark-colored, pallid’: South Abkhaz *aja* ‘pallid, dim, wan (color)’ (arch.). (2) Common Caucasian **ajkʷá* ‘dark-colored, black’: South Abkhaz *ájkʷa* ‘dark(-colored)’, *ájkʷa-ć'ʷa* ‘black’. *d-ĥʷ-ajkʷa-p'* ‘(s)he is dark-skinned’; Ashkharywa *kʷaj-ć'ʷa* ‘black’; Abaza/Tapanta *kʷaj-ć'ʷá* ‘black’.

67. Proto-Indo-European **g^{wh}er-/*g^{wh}or-/*g^{wh}r̥-* ‘(vb.) to gather together, to amass; (n.) handful, bundle’: Czech *hrnouti* ‘to rake together’, *hrst* ‘cupped hand, handful’, *sou-hrn* ‘collection, set’; Slovak *hrst'* ‘cupped hand, handful, bundle’; Macedonian *grne* ‘to gather, to amass, to clasp’; Slovenian *gŕniti* ‘to rake together, to gather’; Serbo-Croatian *gr̀tati* ‘to rake together, to heap up’, *gŕnuti* ‘to rake together, to swarm, to rush’, *grȋst* ‘cupped hand, handful’; Russian (dial.) *gortát'* [гортать] ‘to rake together’, *gorst'* [горсть] ‘cupped hand, handful’; Latvian *gùrste* ‘bundle of flax’. Note: Trubačev (1974— .7: 212—213) derives the Slavic forms listed above from Proto-Indo-European **g(e)r-* ‘to gather together’ (cf. Greek ἀγείρω ‘to gather together, to bring together; to come together, to assemble, to get together; to collect, to gather’), while Derksen (2008:199—200) does not list any cognates from other branches of Indo-European (except for Latvian *gùrste* ‘bundle of flax’) and does not suggest a Proto-Indo-European ancestor.

Northwest Caucasian: Common Abkhaz **gʷárta* ‘herd, flock; large quantity of something’: South Abkhaz *a-gʷárta* ‘herd, flock; large quantity of something’; Ashkharywa *gʷárta* ‘herd, flock, pack’; Abaza/Tapanta *gʷárta* ‘herd, flock, pack’.

68. Proto-Indo-European **henH-t^h-* [**hanH-t^h-*]/**hn̥H-t^h-* ‘an aquatic bird’ (**h* = **$ə_4$*): Sanskrit *ātí-ḥ* ‘an aquatic bird’; Greek (Ionic) νῆσσα, (Attic) νῆττα, (Boeotian) νᾶσσα ‘duck’; Latin *anas*, *-tis* ‘duck’; Old Icelandic *önd* ‘duck’; Old English *ened* ‘duck’; Old High German *anut* ‘duck’ (New High German *Ente*); Lithuanian *ántis* ‘duck’; Old Church Slavic *ǫty* ‘duck’.

Northwest Caucasian: Common Abkhaz **ač'á* ‘quail’: South Abkhaz *ač'á* ‘quail’; Bzyp (indef. sg.) *ač'á-k'* ‘quail’; Abaza/Tapanta *ač'a*, *č'a* ‘quail’.

Note: Proto-Indo-European **ṇ̊* is reflected as **a* in Northwest Caucasian.

69. Proto-Indo-European **kʰem-* ‘lacking horns, hornless’: Sanskrit *śáma-ḥ* ‘hornless’; Greek κεμάς ‘a young deer’; Lithuanian (Žem.) *šmùlas* ‘hornless’; Old Icelandic *hind* ‘a hind, a female deer’; Old English *hind* ‘a hind, a female deer’; Old High German *hinta* ‘a hind, a female deer’.

    Northwest Caucasian: Proto-Circassian **kʰamə* ‘to be insufficient, to lack’: Kabardian *kam* ‘to be insufficient, to lack’, *mə-kamə-w* ‘uninterruptedly’ (*mə-* = negative element’, *-w* = modal case).

70. Proto-Indo-European **kʰotʰ-*, (reduplicated) **kʰotʰ-kʰotʰ-* ‘a male chicken, a cock’: Sanskrit *kukkuṭá-ḥ* (< **kuṭ-kuṭ-á-*) ‘a cock, a wild cock’, (f.) *kukkuṭī́-* ‘hen’, *kakkaṭá-ḥ* (< **kaṭ-kaṭ-á-*) ‘a particular kind of bird’; Old Church Slavic *kokotъ* ‘cock’; Old Czech *kokot* ‘cock, penis’; Latin *coco*, *coco coco* the sound made by a hen clucking; Medieval Latin *coccus* ‘cock’ (only attested in the Salic Law [Lex Salica]); Old Icelandic *kokkr* ‘a cock’; Old English *cocc* ‘cock, male bird’. Note: Modified in various ways in the daughter languages in imitation of a cock crowing.

    Northwest Caucasian: Proto-Circassian **kːatːə* ‘chicken’: Bždeduх *čː'atːə* ‘chicken’; Kabardian *gad* ‘chicken’.

71. Proto-Indo-European **leh-* [**lah-*] (> **lā-*) ‘to bark’ (**h* = **ə₄*): Albanian *leh* ‘to bark’; Lithuanian *lóju*, *lóti* ‘to bark’; Old Church Slavic *lajǫ*, *lajati* ‘to bark’; Russian *lájat'* [лаять] ‘to bark’.

    Northwest Caucasian: Common Abkhaz **la* ‘to bark; dog’: South Abkhaz, *á-la* ‘dog’, *á-la-š-ra* ‘to bark’; Abaza/Tapanta *la* ‘dog’; Ashkharywa *la* ‘dog’.

72. Proto-Indo-European **mel-*/**mḷ̊-* ‘sheep, ram’: Armenian *mal* ‘ram’; Greek μαλλός ‘a lock of wool, the wool of sheep’ (< **mḷ̊-nó-s* ?), μαλλωτάριον ‘sheepskin’.

    Northwest Caucasian: Proto-Circassian **malə* ‘sheep’: Bždeduх *malə* ‘sheep’; Kabardian *mal* ‘sheep’.

73. Proto-Indo-European **mer-kʼʷ-*/**mor-kʼʷ-*/**mṛ̊-kʼʷ-* ‘to evade, to elude, to avoid (hunters) (of animals); to flee from, to escape from, to get away from (hunters) (of animals)’, **mṛ̊-kʼʷ-o-* ‘any wild animal that is pursued or hunted for food or sport, game’ (Indo-Aryan/Indic only): Sanskrit *mṛgá-ḥ* ‘game, deer, wild animal; stag, antelope, gazelle’, *mārgáti*, *mṛgyáti* ‘to hunt, to chase, to

pursue; to seek, to search for'; Pāḷi (m.) *maga-*, *miga-* 'animal for hunting; deer antelope, gazelle', (f.) *migī-* 'doe', *migavā* 'hunt, hunting, stalking'; etc.

Notes:
1. Sanskrit *mārgáti*, *mṛgyáti* is a denominative form derived from *mṛgá-ḥ* (cf. Mayrhofer 1956—1980.II:669—670 and 1986—2001.II:370—371; Buck 1949:§3.79 hunt [vb.]).
2. Mayrhofer (1956—1980.II:669—670) also mentions a secondary stem ("Nebenwurzel") *mṛjáti* 'to roam about, to prowl; to run about, to rove, to roam'.
3. On the comparison of Sanskrit *mṛgá-ḥ* 'game, deer, wild animal; stag, antelope, gazelle' with Avestan *mərəγa-* 'bird', cf. Mayrhofer 1956—1980.II:669—670.

Northwest Caucasian: Common Abkhaz **mara-ħ^{o}ə́* (**ħ^{o}ə* 'to turn') 'to shirk, to elude; to escape (of animals)': South Abkhaz *á-maraħ^{o}-ra* 'to shirk, to elude; to escape (of animals)'.

74. Proto-Indo-European **met^{h}-/*mot^{h}-* 'to twist, to turn, to wind' (Slavic only): Russian *motát'* [мотать] 'to wind, to reel'; Czech *motati* 'to wind'; Polish *motać* 'to wind, to reel'; Serbo-Croatian *mòtati* 'to revolve, to wind, to move, to throw'. Note also: Gothic *maþa* 'worm'; Old Icelandic *maðkr* 'maggot, grub, worm'; Old English *maða* 'maggot, worm, grub'; Dutch *made* 'maggot, grub'; Old High German *mado* 'maggot, worm' (New High German *Made*).

Northwest Caucasian: Common Abkhaz **matə́* 'snake': South Abkhaz *á-mat* 'snake' (indef. sg. *matə́-k'*); Ashkharywa *matə́* 'snake'. For the semantics, cf. Buck 1949:§3.85 snake. Note: Same semantic development/range as in Bzyp *-šaq''-wá* 'winding, bending, circling (for example, of a snake, but also of restless movements)'.

75. Proto-Indo-European **mu(H)-* 'fly, midge, gnat, mosquito' (with numerous variant forms in the daughter languages): (1) Proto-Indo-European **mu-s-* 'fly, mosquito': Greek μυῖα (< **μυσ-ια) 'fly'; Middle Dutch *meusie* 'fly, mosquito'; Lithuanian *mùsė*, *musẽ*, *musià*, *musìs* 'mosquito'; Latvian *mūsa*, *muša* 'fly'; Old Prussian *muso* 'fly'; Old Church Slavic *mъšica* 'mosquito'; Russian (dial.) *mšíca* [мшица] 'midge, gnats, small insects', (dial.) *móxa* [моха] 'midge'. (2) Proto-Indo-European **mu-s-no-* 'fly, midge': Armenian *mun* 'fly, midge'. (3) Proto-Indo-European **mu-s-k^{h}-* 'fly': Latin *musca* 'fly'. (4) Secondary full-grade in Proto-Slavic **mùxa* (< **mows-*) 'fly': Old Church Slavic *muxa* 'fly'; Russian *múxa* [муха] 'fly'; Czech *moucha* 'fly'; Polish *mucha* 'fly'; Serbo-Croatian *mùha* 'fly'; Bulgarian *muxá* 'fly'. (5) Proto-Indo-European **muH-i-A* (> **muwī*), (gen. sg.) **muH-yeA-s* (> **mū-yā-s*) 'gnat, midge': Old Icelandic *mý* 'midge'; Old English *mycge* 'midge'; Dutch *mug* 'gnat'; Old High German *mucka* 'gnat, midge' (New High German *Mücke*).

Northwest Caucasian: Common Abkhaz **məć'ə́* 'fly': Bzyp *a-mć'*, *a-məć'* 'fly'; Abzhywa *a-mć'* 'fly'.

Note: Proto-Indo-European **u* is reflected as **ə* in Northwest Caucasian.

76. Proto-Indo-European **pʰiskʰ-* 'fish': Latin *piscis* 'fish'; Old Irish *íasc* 'fish' (< **pʰeyskʰ-*, with secondary full-grade); Gothic *fisks* 'fish'; Old Icelandic *fiskr* 'fish'; Old English *fisc* 'fish'; Old High German *fisc* 'fish'.

Northwest Caucasian:
A. Common Abkhaz **pśə́-ʒə* 'fish': Bzyp *a-pśə́ʒ* 'fish'; Abzhywa *a-psə́ʒ* 'fish'; Ashkharywa *psəz* 'fish'.
B. Ubykh *psá* 'fish'.
C. Proto-Circassian **Pc:a* 'fish': Bždux *pc:a* 'fish'; Kabardian *bʒa* 'large fish'. Note: Irregular correspondence (cf. Chirikba 1996a:337, §1.5.6).

Note: Proto-Indo-European **pʰis(kʰ)-* = Common Abkhaz **pśV*, Ubykh *psV-*.

77. Proto-Indo-European **pʰos-lo-* 'brood, offspring, progeny' (Germanic only): Proto-Germanic **fas(u)laz* 'brood, offspring, progeny' (cf. Orel 2003:94) > Old Icelandic *fösull* 'brood'; Old English *fæsl* 'offspring, progeny'; Middle Low German *vasel* 'mature bull'; Old High German *fasal* 'offspring, progeny, kin' (New High German *Fasel* 'brood, young of animals'). Note: Proto-Indo-European **pʰos-lo-* is usually considered to be related to **pʰes-*/**pʰos-* 'penis': Sanskrit *pásas-* 'penis'; Greek πέος 'penis', πόσθη 'penis'; Latin *pēnis* (< Pre-Latin **pes-ni-s*) 'penis'. Cf., for example, Pokorny 1959:824.

Northwest Caucasian:
A. Common Abkhaz **psa* 'cattle' in **psá-śa* 'small cattle' (**-śa* 'small'): Bzyp *a-psá-śa* 'small cattle'; Abzhywa *a-psá-sa* 'small cattle'.
B. Proto-Circassian **Psaśʷə* 'pregnant (of animals)': Bždux *psaśʷə* 'pregnant (of animals)'; Kabardian *psaf* 'pregnant (of animals)'. Note: Kuipers (1975:24) writes **Psaşʷə*.

Note: Proto-Indo-European **pʰVs-* = Common Abkhaz **psV-*, Proto-Circassian **PsV-*.

VIII. Plants, Vegetation, Agriculture

78. Proto-Indo-European **ʔey-*/**ʔoy-* used in various tree names (**ʔ* = **ḫ₁*): Greek οἴη, ὄη, ὄα 'the service-tree'; Old Irish *éo* 'yew-tree'; Old English *īw* 'yew-tree'; Old Saxon (pl.) *īchas* 'yew-tree'; Old High German *īgo* 'yew-tree'; Lithuanian *ievà*, *jievà* 'bird-cherry tree'; Russian Church Slavic *iva* 'willow-tree'.

Northwest Caucasian: South Abkhaz *ajə́-ra* ‘plant, vegetation’; Abaza/Tapanta *ħa-jə-ra* ‘plant, vegetation’. Perhaps also Common Abkhaz **aja/ə-ć’ºá*: South Abkhaz *ája-ć’ºa* ‘green, blue’; Ashkharywa *aj-ć’ºa* ‘green’.

79. Proto-Indo-European (extended form) **dʰergʰ-*, **dʰregʰ-* ‘thorny plant’: Old Irish *draigen* ‘sloe tree, blackthorn’; Middle Welsh *draen*, *drain* ‘thornbush, brambles, briars’; Old High German *dirn-baum*, *tirn-pauma* ‘cornel’; Greek τέρχνος, τρέχνος ‘twig, branch’; Russian (dial.) *déren*, *derén* [деpен] ‘cornel’.

    Northwest Caucasian: Common Abkhaz **dárə* ‘to sting (of nettle)’: Bždedux *a-dar-ra* ‘to sting (of nettle)’.

80. Proto-Indo-European **hel-* [**hal-*] ‘alder’ (**h* = **ə₄*): Latin *alnus* (< Proto-Italic **alsno-*) ‘alder’; Old Icelandic *ölr* ‘alder-tree’; Old English *alor* ‘alder’; Old High German *elira* ‘alder’; Russian *ol'xá* [ольха] ‘alder(-tree)’; Lithuanian *alk̃snis*, *elk̃snis*, (dial.) *aliksnis* ‘alder’.

    Northwest Caucasian: Common Abkhaz **alə́* ‘alder(-tree)’: Bzyp (indef. sg.) *l-k’ə́* // *lə́-k’* ‘alder(-tree)’; South Abkhaz *ál(-c’la)* ‘alder(-tree)’; Ashkharywa *al-t’a* ‘alder(-tree)’; Abaza/Tapanta *al-č’ºə́*, *al-č’ə́*, (indef. sg.) *al-č’ə́-k’* ‘alder(-tree)’.

81. Proto-Indo-European **ḫ̯emH-* [**ḫ̯amH-*] ‘to cut, to mow’ (**ḫ̯* = **ə₂*): Hittite *ḫameššа-* ‘spring (season)’; Greek ἀμάω ‘to cut, to mow, to reap’, ἄμητος ‘reaping, harvesting; harvest, harvest-time’; Old English *māwan* ‘to mow’, *mæþ* ‘the act of mowing; hay-harvest’; Old Frisian *mēa* ‘to mow’; Old High German *māen* ‘to mow, to cut, to reap’.

    Northwest Caucasian: Proto-Circassian **ħam(a)* ‘threshing-floor’: Bždedux *ħāma* ‘threshing-floor’; Kabardian *ħam* ‘threshing-floor’.

82. Proto-Indo-European **kʰamero-* (> Greek **kamaro-*; Balto-Slavic **kemero-*; Germanic **χamirō*) ‘name of a (poisonous) plant’: Greek κάμαρος ‘larkspur (*Delphinium*)’, κάμ(μ)αρον ‘aconite’; Old High German *hemera* ‘hellebore’; Lithuanian *kẽmeras* ‘hemp agrimony, burr marigold’; Russian Church Slavic *čemerь* ‘hellebore’; Russian *čemeríca* [чемерица] ‘hellebore’.

    Northwest Caucasian: Common Abkhaz **kámp’ərə* ‘a kind of umbellate plant with white floscule’: South Abkhaz *a-kámp’ər* ‘a kind of umbellate plant with white floscule’.

    Note: Probably borrowed by both Proto-Indo-European and Northwest Caucasian from an unknown source.

83. Proto-Indo-European *k^heAk^hA- [*k^haAk^hA-] (> *$k^hāk^hA$-) ‘branch, twig’: Sanskrit *śā́khā* ‘branch’; Armenian *c^hax* ‘twig’; Albanian *thekë* ‘fringe’; Gothic *hōha* ‘plow’; Lithuanian *šakà* ‘branch, bough, twig’; Russian *soxá* [coxa] ‘(wooden) plow’; Polish *socha* ‘two-pronged fork’; Serbo-Croatian *sòha* ‘forked stick’.

Notes:
1. This is probably a reduplicated stem: *k^heA-k^heA-.
2. The Slavic forms may be borrowings.

Northwest Caucasian:
A. Proto-Circassian *$k^hə$ ‘brushwood, twig’: Bžedux *$č^h'ə$* ‘brushwood, twig’; Kabardian *kə* ‘brushwood, twig’.
B. Common Abkhaz *káka* grown thick, bushed out (of plants)’: South Abkhaz *a-káka* ‘grown thick, bushed out (of plants)’, *-káka-ʒa* ‘thickly, simultaneously going up (of plants, hair)’. Note: There are numerous derivatives in both Circassian and Abkhaz-Abaza. Only the forms closest to what is found in Indo-European are given above.

84. Proto-Indo-European *lek’-/*lok’- ‘to twist, to turn, to bend, to wind’, *lok’-eA (> *lok’-ā) ‘vine’: Manichaean Middle Persian *rz* /raz/ ‘vineyard’; Pahlavi *raz* ‘vine, vineyard’; Old Church Slavic *loza* ‘vine’; Russian *lozá* [лоза] ‘branch, twig, rod; vine’; Slovak *loza* ‘vine, sapling’; Polish *łoza* ‘willow, osier, vine’; Bulgarian *lozá* ‘vine’; Serbo-Croatian *lòza* ‘vine, umbilical cord’.

Notes:
1. Mann (1984—1987:659) reconstructs Proto-Indo-European *laĝ- ‘(vb.) to wind, to creep, to twist; (n.) winding object, creeper’.
2. Hittite (3rd sg. pres. act.) *la-a-ki* ‘to knock out (a tooth); to turn (one’s ear or eyes toward); to train (a grapevine branch)’, (2nd sg. pres. act.) *la-ak-nu-si* ‘to knock over; to overturn (stelas, thrones, tables); to fell (a tree); (a wrestling maneuver:) to throw, to make (an opponent) fall; to train, to bend (a vine); to make (someone) fall out of favor; to bend (someone) to one’s own viewpoint, to persuade; to pass (the day or night) sleepless’, (3rd sg. pres. mid.) *la-ga-a-ri* ‘to fall down, to fall over, to be toppled’, (gen. sg.) *la-ga-na-aš* ‘bent, inclination, disposition (?)’ (all forms and meanings are cited from *The Hittite Dictionary of the Oriental Institute of the University of Chicago*, fasc. L-N [1989], pp. 17—18 and 19—20) are traditionally derived from Proto-Indo-European *leg^h-/*log^h- ‘to put, place, lay, or set down; to lie down’ (cf. Kloekhorst 2008:514—515; Puhvel 1984— .5: 33—37). However, a better derivation semantically would be from Proto-Indo-European *lek’-/*lok’- ‘to twist, to turn, to bend, to wind’. For example, ‘to toss and turn’ is a more colloquial way of saying ‘to pass (the day or night) sleepless’.

Northwest Caucasian: Common Abkhaz **lak''ə́* ‘to curve, to bend, to wind’: South Abkhaz *á-lak''* ‘curved, bent’, *a-lak''-rá* ‘to curve, to bend, to wind’.

85. Proto-Indo-European **meh-lo-m* [**mah-lo-m*] (> **mā-lo-m*) ‘apple’ (**h* = **$ḫ_4$*): Greek (Ionic) μῆλον (Doric μᾶλον) ‘apple’; Latin *mālum* ‘apple’, *mālus* ‘apple-tree’; Albanian *mollë* ‘apple(-tree)’ (if not borrowed from Latin). Note: Not related to Hittite (nom. sg.) *ma-a-aḫ-la-aš* ‘branch of a grapevine’ (cf. Kloekhorst 2008b:539—540; Beekes 2010.II:943—944).

Northwest Caucasian: (1) Proto-Circassian **mə* ‘wild apple’: Bždeduх *mə* ‘wild apple’; Kabardian *mə* ‘wild apple’. (2) Proto-Circassian **məya* ‘wild apple-tree’: Bždeduх *məya* ‘wild apple-tree’; Kabardian *may* ‘wild apple-tree’.

86. Proto-Indo-European **met^h-* ‘to measure’ (> ‘to reap, to mow’): Latin *metō* ‘to reap, to mow; to gather, to harvest’; Welsh *medi* ‘to mow, to harvest’, *medel* ‘a group (of reapers)’; Lithuanian *metù*, *mèsti* ‘to throw, to hurl, to fling’, *mẽtas* ‘time’, *mãtas* ‘measure’; Old Church Slavic *metǫ*, *mesti* ‘to throw, to sweep’.

Northwest Caucasian: Common Abkhaz **matá* ‘piece, strip of field to be hoed or plowed’: South Abkhaz *á-mata* ‘piece, strip of field to be hoed or plowed’.

87. Proto-Indo-European **mor-* ‘mulberry, blackberry’: Greek μόρον, (Hesychius) μῶρα· συκάμινα ‘mulberry, blackberry’, μορέα ‘mulberry-tree’; Armenian *mor* ‘blackberry’; Latin *mōrum* ‘mulberry, blackberry’, *mōrus* ‘mulberry-tree’; Middle Irish *merenn* ‘mulberry’; Old English *mōrbēam*, *mūrbēam* ‘mulberry-tree’, *mōrberie*, *mūrberie* ‘mulberry’; Old High German *mūrberi*, *mōrberi* ‘mulberry’; Lithuanian *mõras* ‘mulberry’.

Northwest Caucasian: Proto-Circassian **mark'^{o}a* ‘mulberry, blackberry’: Temirgoy *mārk'^{o}a* ‘mulberry, blackberry’; Kabardian *marāk'^{o}a* ‘mulberry, blackberry’.

Note: This may be a “Wanderwort”, borrowed by both Proto-Indo-European and Northwest Caucasian.

88. Proto-Indo-European **mes-t'o-*/**mos-t'o-* ‘mast; the fruit of the oak, beech, and other forest trees; acorns or nuts collectively’: Old English *mæst* ‘mast’; Old High German *mast* ‘mast’; Old Irish *mess* ‘acorns, tree-fruit’; Welsh (pl.) *mes* ‘acorns, tree-fruit’.

Northwest Caucasian: (1) Proto-Circassian **məŠk'^{o}ə* ‘acorn’: Bždeduх *məšk'^{o}ə* ‘acorn’; Kabardian *məšk'^{o}* ‘acorn’. (2) Proto-Circassian **məŠx^{o}ə* ‘acorn’: Bždeduх *məfə* ‘acorn’; Kabardian *məšx^{o}ə(m)p'a* ‘acorn’.

89. Proto-Indo-European *p^hes-/*p^hos- ‘(vb.) to throw, to cast, to winnow (grain); (n.) chaff, husk’: Tocharian A *psäl*, B *pīsäl* ‘chaff (of grain), husk’ (< Proto-Tocharian *$p\underset{\frown}{i}$äsäl*); Middle Dutch *vese* ‘fiber, husk; fringe’; Old High German *fesa* ‘chaff’.

    Northwest Caucasian: (1) Common Abkhaz **psa* ‘to pour, to strew’: South Abkhaz *á-k°-psa-ra* ‘to pour something on, to sow’; Abaza/Tapanta *á-k°-psa-ra* ‘to pour something on, to sow’. (2) Common Abkhaz **psa-q''á* ‘to winnow (grain)’: South Abkhaz *á-psa-q''a-ra* ‘to winnow (grain)’.

    Note: Proto-Indo-European *p^hVs- = Northwest Caucasian *psV-.

90. Proto-Indo-European **seʔ(-y/i-)* (> **sē(-y/i-)*) ‘to sow’ **ʔ* (= *$*\underset{\frown}{ə}_1$*): Latin *sēmen* ‘seed’, *serō* (< **si-sʔ-e/o-*) ‘to plant, to sow seeds’; Old Irish *síl* ‘seed’; Gothic *saian* ‘to sow, to plant’; Old Icelandic *sá* ‘to sow’, *sáð* ‘seed’; Old English *sāwan* ‘to sow’, *sǣd* ‘seed’; Old Saxon *sāian* ‘to sow’; Old High German *sāen* ‘sow’ (New High German *säen*); Old Church Slavic *sějǫ*, *sějati* ‘to sow’, *sěmę* ‘seed’; Russian *séjat'* [сеять] ‘to sow’, *sémja* [семя] ‘seed. grain’; Lithuanian *sėju*, *sėjau*, *sėti* ‘to sow’, *sėmenys* ‘linseed, flaxseed’, *sėkla* ‘seed, sperm’.

    Northwest Caucasian: Proto-Circassian **sa* ‘to sow’: Bžedux *xā-sa* ‘to sow’ (*xa-* ‘in a mass’); Kabardian *sa* ‘to sow’; Temirgoy (in compounds) *-sa-* ‘to sow; to put, to stick’.

IX. Possession, Property, Commerce

91. Proto-Indo-European *d^hew-r-yo-s* ‘of great value, cost, prestige, etc.’ (only in Germanic): Proto-Germanic **ðeurjaz* ‘costly, expensive, valuable’ > Old Icelandic *dýrr* ‘high-priced, costly, expensive, precious’; Old English *dēore*, *dīere* ‘precious, costly, valuable; noble, excellent’; Old Frisian *diore*, *diure* ‘costly, expensive’; Old Saxon *diuri* ‘valuable, expensive’; Old High German *tiuri* ‘valuable, expensive’. Proto-Germanic **ðeurja-līkaz* ‘glorious, excellent’ > Old Icelandic *dýr-ligr* ‘glorious’; Old Saxon *diur-līk* ‘valuable, excellent’; Old High German *tiur-līh* ‘valuable, excellent’. Proto-Germanic **ðeuriþō* ‘glory, fame’ > Old Icelandic *dýrð* ‘glory’; Old Saxon *diuritha* ‘glory, fame’; Old High German *tiurida* ‘glory, fame’.

    Northwest Caucasian: Common Abkhaz **də́wə* ‘big, great’: South Abkhaz *dəw* ‘big, great’; Ashkharywa *dəw* ‘big, great’; Abaza/Tapanta *dəw* ‘big, great’.

92. Proto-Indo-European *$g^{wh}or$-o-* ‘open area set aside as a public space’ (only in Italic): Latin *forum* ‘an open square, marketplace, public space’; Umbrian (acc. sg.) *furo*, **furu** ‘forum’. Note: Latin *forum* is usually (though not always) derived from Proto-Indo-European *$d^hw\breve{o}r$-* ‘door’ (cf. Latin *foris* ‘door’).

However, the semantic development required to get from ‘door’ to *forum* seems rather contrived.

Northwest Caucasian: (1) Common Abkhaz **g^{o}ára* ‘yard’: Bzyp *a-g^{o}ár(a)* ‘yard’; Abzhywa *a-g^{o}ára* ‘yard; cattle-yard; fence’; Abaza/Tapanta *g^{o}ára* ‘fence’; Ashkharywa (Apsua) *a-g^{o}ára* ‘wattled fence’. (2) Common Abkhaz **g^{o}ár-pə* (< **g^{o}ára* ‘court, yard’, **pə* ‘nose’ > ‘front; before’): South Abkhaz *a-g^{o}árp* ‘part of big yard around the house’.

93. Proto-Indo-European **k^{h}at^{h}-* ‘rag, tatter’ (only in Germanic): Old High German *hadara* ‘patch, rag’; Middle High German *hader*, also *hadel*, ‘rag, tatter’; Old Saxon *hađilīn* ‘rag, tatter’.

Northwest Caucasian: Proto-Circassian **k^{o}aTx̌a* ‘to tear to shreds (tr.)’: Temirgoy *č'atx̌a-n* ‘to tear to shreds (tr.)’; Kabardian *kātx̌a* ‘to tear to shreds (tr.)’.

94. Proto-Indo-European **mis-* ‘to fill, to fulfill’, **mis-ri-* ‘full, fulfilled, complete’ (Hittite only): Hittite (nom. sg.) *mi-iš-ri-ya-an-za*, (acc. sg.) *mi-iš-ri-wa-an-ta-an* meaning uncertain, either ‘perfect, complete, full’ or ‘bright, splendid, glorious, luminous, glowing, beautiful’. Depending upon context, both meanings appear to fit the available textual sources (for more information, cf. *The Hittite Dictionary of the Oriental Institute of the University of Chicago*, fasc. L-N [1989], pp. 297—299).

Notes:

1. Proto-Indo-European **mis-d^{h}-o-* ‘prize, reward; pay, wages, salary, recompense’ (cf. Sanskrit *mīḍhá-m* [< **mizdhá-*] ‘contest, prize, reward’; Avestan *mīžda-* ‘wages’; Greek μισθός ‘recompense, reward; wages, pay, allowance’; Gothic *mizdō* ‘pay, wages, reward, recompense’; Old English *mēd* ‘reward, pay, price, compensation, bribe’, *meord* ‘pay, reward’; Old High German *mêta*, *mieta* ‘wages, reward’ [New High German *Miete* ‘rent’]; Old Church Slavic *mьzda* ‘payment, salary, fee, gift’; Serbo-Croatian *màzda* ‘recompense, payment, pay; revenge, punishment’; etc.) may belong here as well, if we assume that it is derived from a Proto-Indo-European root **mis-* ‘to fill, to fulfill’, as in Greek πληρόω ‘to fill, to fulfill; to fill full (of food), to gorge, to satiate; to be filled full of, to be satisfied; (rarely) to fill with; to make full or complete’ also ‘to render, to pay in full’. Such a root would easily account for the Hittite meanings ‘perfect, complete, full’. According to Benveniste (1973:131—137), the original meaning of Proto-Indo-European **mis-d^{h}-o-* was something like ‘a prize or reward won as a result of competition or a contest’, first extended to designate the competition or contest itself and then later further extended to include ‘pay, wages, salary, recompense’. That is to say, one has successfully fulfilled or completed the requirements of a

competition or contest and is, accordingly, given appropriate recognition thereof in the form of a prize or reward. As a final point, it may be noted that Wodtko—Irslinger—Schneider (2008:492—493) reconstruct Proto-Indo-European **mis-dʰh₁-ó-* 'payment, remuneration, pay, salary, wages; reward, recompense, compensation', that is, **mis-* (< **meios*) 'exchange, barter' plus **dʰeh₁-* 'to put, to place, to set'. This proposal is not convincing, especially in light of Benveniste's study.

2. The meanings 'bright, splendid, glorious, luminous, glowing, beautiful' assigned to Hittite (nom. sg.) *mi-iš-ri-ya-an-za*, (acc. sg.) *mi-iš-ri-wa-an-ta-an* remain enigmatic. Perhaps two separate stems have merged in Hittite, or perhaps these meanings are derived from the meanings 'perfect, complete, full'. I suspect the latter explanation to be the case.

Northwest Caucasian: (1) Common Abkhaz **məšə́* 'day; happy, lucky': South Abkhaz *a-mš* 'day; happy, lucky', (indef. sg. *məš-k'ə́*); Abaza/Tapanta *mšə* 'day; happy, lucky' (indef. sg. *məš-k'ə́*). Assuming semantic development from 'fulfilled, content, satisfied' > 'happy'. (2) Common Abkhaz **məž-dá* 'unhappy' (**məšə* 'happy', **da* 'without'): Abaza/Tapanta *məžda* 'unhappy, poor, miserable'; South Abkhaz *á-məžda* 'unhappy, poor, miserable'.

Notes:

1. Proto-Indo-European **i* is reflected as **ə* in Northwest Caucasian.
2. Northwest Caucasian **š* = Proto-Indo-European **s*.
3. The semantic range exhibited by Common Abkhaz **məšə́*, 'day', on the one hand, and 'happy, lucky', on the other hand, mirrors the semantic range exhibited by Hittite: either 'bright, splendid, glorious, luminous, glowing, beautiful' or 'perfect, complete, full'.

95. Proto-Indo-European **wes-no-m* 'price', **wes-* 'to buy, to sell': Latin *vēnum* (< **wes-no-m*) 'sale'; Sanskrit *vasná-m* 'price, value'; Hittite *uš-ša-ni-ya-zi* 'to put up for sale'; Greek ὦνος (< **wós-no-s*) 'price'.

Northwest Caucasian: Proto-Circassian **wasa* 'price': Bžedux *wāsa* 'price'; Kabardian *wāsa* 'price'.

X. Death, Burial

96. Proto-Indo-European **dʰer-bʰ-*/**dʰor-bʰ-* 'to exert oneself; to perish, to vanish' (Germanic only): Old English *deorfan* 'to perish, to be in peril, to be wrecked'; (also) 'to exert oneself, to labor', *deorf* 'labor, effort; difficulty, hardship; trouble, danger'; Old Frisian *derve* 'fierce, severe'; Old Saxon *derƀi* 'powerful; hostile, bad'; Middle Low German *derven* 'to shrink, to wither, to spoil', *vorderven* 'to perish'; Middle Dutch *bederven* 'to be damaged, to perish'; Old High German *verderben* 'to perish, to be killed, to die' (New High German *verderben*). Note: The unextended Proto-Indo-European root was **dʰer-*/**dʰor-*

/*$d^h\underset{\circ}{r}$- ‘to exert oneself, to toil, to wear oneself out; to become tired, weary, debilitated’. This root is preserved in Hittite in: (3rd pl. pres. act.) *t[a-]ri-ya-an-zi*, (1st sg. pret. act.) *ta-re-eḫ-ḫu-un* ‘to exert oneself, to become tired’, (3rd sg. pres. act.) *da-ri-ya-nu-zi*, (3rd sg. pret. act.) *ta-ri-ya-nu-ut* ‘to tire, to make tired’, (nom. sg.) *ta-ri-ya-aš-ḫa-aš*, *da-ri-ya-aš-ḫa-aš*, *tar-ri-ya-aš-ḫa-aš* ‘tiredness, fatigue’.

Northwest Caucasian: Common Abkhaz **darśmá* ‘to wither’: Bzyp *a-dərśma-x̌ə́* ‘to wither’; Abzhywa *a-darsmá* ‘to wither’.

97. Proto-Indo-European *d^hew-/*d^how-/*d^hu- ‘(vb.) to pass away, to die; (n.) end, death’: Gothic *dauþs* ‘dead’, *dauþus* ‘death’; Old Icelandic *deyja* ‘to die’, *dauði* ‘death’, *dauðr* ‘dead’; Old English *dēaþ* ‘death’; Old Saxon *dōian* ‘to die’, *dōth* ‘death’; Old High German *touwan* ‘to die’, *tōten*, *tōden* ‘to kill’ (New High German *töten*), *tōd* ‘death’ (New High German *Tod*); Latin *fūnus* ‘funeral, burial, corpse, death’; Old Irish *díth* ‘end, death’.

Northwest Caucasian: Ubykh *dəwá* ‘death’, *dəwáła* ‘the manner of dying’, *dəwáy'a* ‘the time of death’.

98. Proto-Indo-European *$d^h\underset{\circ}{m}b^h$- ‘burial mound, kurgan’: Armenian *damban*, *dambaran* ‘grave, tomb’; Greek τάφος (< *$d^h\underset{\circ}{m}b^ho$-*s*) ‘funeral, burial, the act of burying; burial mound, tomb’, ταφή ‘burial, burial-place’, θάπτω (< *$d^h\underset{\circ}{m}b^hy\bar{o}$) ‘to honor with funeral rites, to bury’.

Northwest Caucasian: Common Abkhaz **damrá* ‘grave’: Bzyp *a-dəmrá* ‘grave’; South Abkhaz *a-damrá* ‘grave’; Abaza/Tapanta *damrá* ‘grave’ (only in a proverb).

99. Proto-Indo-European *p^hes-/*p^hos- ‘to die’: Latin *pestis* ‘physical destruction or death; plague, pestilence’, *prestilentus* ‘unhealthy’; Late Avestan *-pastay* in *kapastay*- ‘name of an illness’.

Northwest Caucasian: Common Abkhaz **pśə* ‘to die’: Bzyp *a-pś-rá* ‘to die’, *a-pśə́* ‘dead (man), corpse’, *a-pś-x̌$^{\circ}$ə́* ‘funeral repast’, *a-r-pś-rá* ‘to put/blow out (of fire, light); to kill’; Abzhywa *a-ps-x̌$^{\circ}$ə́* ‘funeral repast’; Abaza/Tapanta *ps-ra* ‘to die’, *r-ps-ra* ‘to kill; to exhaust, to starve’, *psə* ‘dead (man), corpse’, *ps-qa* ‘the dead, corpse’, *ps-qa-ps-ra* ‘to die (of animals)’, *ps-q$^{\circ}$ə* ‘funeral repast’.

Note: Proto-Indo-European *p^hVs- = Northwest Caucasian **pśV*-.

XI. Travel, Passage, Journey

100. Proto-Indo-European *p^her-/*p^hor-/*$p^h\underset{\circ}{r}$- ‘to go or pass; to go or pass over or across; to go forth or out’: Sanskrit *píparti* ‘to bring over or to, to bring out of,

to deliver from, to rescue, to save, to protect, to escort, to further, to promote; to surpass, to excel', (causative) *pārāyati* 'to bring over or out', *pārá-ḥ* 'bringing across'; Greek περάω 'to pass across or through, to pass over, to pass, to cross', πορίζω 'to carry, to bring about, to provide, to furnish, to supply, to procure, to cause', πόρος 'a means of crossing a river, ford, ferry'; Latin *portō* 'to bear or carry along, to convey', *porta* 'gate, door'; Gothic **faran* 'to wander, to travel', **farjan* 'to travel', **at-farjan* 'to put into port, to land', **us-farþō* 'shipwreck'; Old Icelandic *ferja* 'to ferry over a river or strait', *far* 'a means of passage, ship', *fara* 'to move, to pass along, to go', *farmr* 'freight, cargo, load', *fœra* 'to bring, to convey', *för* 'journey'; Old English *faran* 'to go, to march, to travel', *fær* 'going, passage, journey', *ferian* 'to carry, to convey, to lead', *fōr* 'movement, motion, course', *ford* 'ford'; Old High German *faran* 'to travel', *ferien*, *ferren* 'to lead, to ferry across', *fuoren* 'to lead, to convey', *fuora* 'journey, way', *furt* 'ford'.

Northwest Caucasian: Proto-Circassian *p^{h}ərx̌^{o}a 'passageway, porch': Kabardian *pərx̌^{o}a* 'passageway, porch'.

101. Proto-Indo-European *mo$\underset{\sim}{ǵ}^{w}$- (> *mō̆w-) 'to move' (*$\underset{\sim}{ǵ}^{w}$ = *$H_3{}^{w}$): Sanskrit *mī́vati* 'to move, to push'; Khotan Saka *mvar-* (< *mūr-), *mvīr-* (< *mūry-) 'to move', *mvara* 'movement', *mvarye* (< *mūriyā-) 'movement, behavior, course (of action), way of acting'; Latin *moveō* 'to move, to set in motion, to stir', *mōtus* (< Pre-Latin **mowe-to-*) 'motion, movement', *mōmentum* 'movement, motion'. Note: Not related to Hittite (3rd sg. pres.) *ma-(a-)uš-zi* 'to fall'; Lithuanian *máudyti* 'to bathe'.

Northwest Caucasian: Common Abkhaz **məḥ^{o}á* 'road, way, path': South Abkhaz *ámj^{o}a* 'road, way, path'; Ashkharywa *á-mḥ^{o}a*/*məḥ^{o}a* 'road, way, path'; Abaza/Tapanta *mḥ^{o}a* 'road, way, path'.

XII. Dwellings, Buildings

102. Proto-Indo-European *ʔab^{h}-ro- 'strong, powerful, mighty' (*ʔ = *h_{2}): Gothic *abrs* 'strong, violent, great, mighty'; Old Icelandic *afar-* 'very, exceedingly', *afr* 'strong'; Old Irish *abar-* 'very' (Middle Irish *abor-*); Welsh *afr-* 'very'.

Northwest Caucasian: Common Abkhaz **abḥá* 'fortress' (< 'stronghold'): South Abkhaz *abaá* 'fortress, stone palace, stone fence', (indef. sg. *baá-k'*); Abzhywa also *abaá-k'*. For the semantics, cf. Buck (1949:§20.35 fortress): "Most of the modern words [for fortress] are derived from those for 'strong' or 'firm'…"

103. Proto-Indo-European *b^{h}ew(H)-/*b^{h}ow(H)-/*b^{h}u(H)- 'to spend (time), to abide, to dwell': Sanskrit *bhávati* 'to become, to be, to exist, to live, to stay, to abide'; Albanian *buj* 'to spend the night'; Gothic *bauan* 'to dwell, to inhabit';

Old Icelandic *búa* ‘to prepare, to make ready; to dress, to attire, to adorn; to fix one’s abode in a place; to deal with, to treat; to live, to dwell; to have a household; to be; to behave, to conduct oneself’, *bú* ‘household, farming’, *ból* ‘lair’; Old English *būan* ‘to dwell, to inhabit, to occupy (house)’, *bū* ‘dwelling’, *būnes* ‘dwelling’, *būr* ‘bower, apartment, chamber; storehouse, cottage, dwelling’, *bōgian* ‘to dwell, to take up one’s abode’; Old Frisian *bowa*, *būwa* ‘to dwell’, *bōgia* ‘to dwell’; Old Saxon *būan* ‘to dwell’; Old High German *būan*, *būwan*, *būen*, *būwen* ‘to dwell’ (New High German *bauen*).

Northwest Caucasian:

A. Common Abkhaz **báwra* ‘cattle-shed, cow-house’: Abaza/Tapanta *báwra* ‘cattle-shed, cow-house, barn’; South Abkhaz *a-báwra* ‘cattle-shed, cow-house’; Sadz *a-bōra* ‘cattle-shed, cow-house’.
B. Proto-Circassian **bə* ‘den (of an animal)’: Bžedux *bə* ‘den (of an animal)’; Kabardian *λa-m-b* ‘footprint’. Semantic development as in Old Icelandic *ból* ‘lair’ cited above.

Note: Proto-Indo-European **u* is reflected as **ə* in Northwest Caucasian.

104. Proto-Indo-European **kʰelH-*/**kʰolH-*/**kʰl̥H-* ‘hut’: Sanskrit *śā́lā* ‘building, house, room’; Greek καλιά (Ionic καλιή) ‘a wooden dwelling, a hut’, καλῐ́ός ‘a cabin, cot’, καλιάς ‘a hut’. Note: Some scholars have suggested that the Greek forms cited above are to be derived from the same root found in καλύπτω ‘to cover with (a thing); to cover or conceal; to cover over’, while others (the majority) reject this view.

Northwest Caucasian:

A. Common Abkhaz **k'ála*: Bzyp *a-k'al* ‘hut’; Ashkharywa *k'ála* ‘hut’; Abzhywa *a-k'ála* ‘hut’; Abaza/Tapanta *k'ála* ‘hut’.
B. Proto-Circassian **kʰ(a)lə* ‘hut’: Temirgoy *č'(a)lə* ‘hut’; Kabardian *kəl* ‘hut’.

105. Proto-Indo-European **kʰetʰ-*/**kʰotʰ-* ‘enclosed area, covered area’: Old English *heaðor* ‘restraint, confinement’, *heaðorian* ‘to shut in, to restrain, to confine’; Old Church Slavic *kotьcь* ‘cage’; Old Czech *kot* ‘booth, stall (market)’; Serbo-Croatian (dial.) *kôt* ‘sty for domestic animals, young animals’, *kòtac* ‘cattle-shed, weir’; Slovenian *kótəc* ‘compartment of a stable, pig-sty, bird-cage’. Perhaps also Avestan *kata-* ‘room, house’; Late Avestan *kata-* ‘storage room, cellar’; Khotan Saka *kata-* ‘covered place, house’; Farsi *kad* ‘house’; Sogdian *kt'ky* ‘house’; Pashto *kəlai* ‘village’ (*-l-* < *-t-*), *čat* ‘roof’.

Northwest Caucasian:

A. Proto-Circassian **kʰ'atʰə* ‘sheep-shed’: Bžedux *čʰ'atʰə* ‘sheep-shed’; Kabardian *kat* ‘sheep-shed’.

B. Common Abkhaz **kə́ta* ‘village’: Ashkharywa *a-kə́t* ‘village’; South Abkhaz *a-kə́ta* ‘village’; Abaza/Tapanta *kə́t* ‘village’.

106. Proto-Indo-European (reduced-grade) **n̥s-tʰo-* ‘home’ (Indo-Iranian only): Sanskrit *ástam* ‘home’; Avestan *astəm* ‘home, dwelling’. The full-grade form (Proto-Indo-European **nes-*/**nos-* ‘to return safely home, to be with’) is preserved in the following: Sanskrit *násate* ‘to approach, to resort to, to join’; Greek νέομαι ‘to go or come (mostly with future sense); to return, to go back’, νοστέω ‘to go or come home, to return home’, νόστος ‘return (home)’; Gothic *ga-nisan* ‘to rescue, to be saved’; Old English *nest* ‘food, provisions, rations’. Perhaps also Tocharian A *nas-* ‘to be’, B *nes-* ‘to be, to exist, to become’ (rejected by Adams 2013:367).

Northwest Caucasian: Common Abkhaz **aš-tá* ‘court, yard’ (**-ta* locative suffix): South Abkhaz *ášta* ‘court, yard’; Bzyp (indef. sg.) *šta-k’*, *aštá-k’* ‘court, yard’, (poss.) *s-ášta* ‘my court, my field’; Abaza/Tapanta *ášta*, (indef. sg.) *aštá-k’* ‘the place of/for settlement’.

Note: Proto-Indo-European **n̥* is reflected as **a* in Northwest Caucasian.

107. Proto-Indo-European **wen-*/**won-*/**wn̥-* ‘to dwell, to abide, to remain’: Proto-Germanic **wunan* ‘to dwell, to abide, to remain’ > Old Icelandic *una* ‘to be content in a place; to dwell, to abide’; Old English *wunian* ‘to dwell, to remain, to continue (in time and space); to inhabit, to remain in’, *wunung* ‘dwelling (act and place)’; Old High German *wonēn*, *wonan*, *wanēn* ‘to dwell, to remain’.

Northwest Caucasian: Proto-Circassian **wəna* ‘house’: Bždedux *wəna* ‘house’; Kabardian *wəna* ‘house’. Note: Abkhaz also has *ʕʷəna* ‘house’, which points to Proto-Northwest Caucasian **ĝuna* (personal communication from John Colarusso).

XIII. Physical Environment, Weather

108. Proto-Indo-European **ʔoh̯h̯ro-* (> **ōro-*) ‘ore; a mineral or rock from which a metal can be extracted or mined’ (Germanic only) (**ʔ* = **ə̂₁*; **h̯h̯* = **ə̂₂*): Old English *ōra* ‘ore, unwrought metal’; Dutch *oer* ‘ore’. Note: According to Onions (1966:632), “of unknown origin”.

Northwest Caucasian: Common Abkhaz **aǩra* ‘rock’: South Abkhaz *á-ǩra* ‘rock’; Bzyp (poss.) *s-áǩ-ra*, *sə́-ǩra* ‘my rock’, (indef. sg.) *ǩra-k’* ‘rock’; Abaza/Tapanta *áǩra* ‘rock’.

109. Proto-Indo-European **dʰoH-ro-* (> **dʰō-ro-*) or **dʰoH-lo-* (> **dʰō-lo-*) ‘a stream or current of water; a water-course; a torrent, a flood’ (Indo-Aryan/Indic only): Sanskrit *dhā́rā* ‘a stream or current of water; a water-course; a torrent, a

flood'; Pāḷi *dhārā* 'torrent, stream, flow, shower'; Hindi *dhār* 'heavy shower (of rain); flow, current; channel (of a river); spring'.

Northwest Caucasian:
A. Common Abkhaz **ʒə* 'water, river': South Abkhaz *a-ʒə́* 'water, river'; Abzhywa *a-ʒə́* 'water, river'; Abaza/Tapanta *ʒə* 'water, river', *ʒə-ɦ°* 'river'.
B. Ubykh *ʒ-* in *aʒə́n* 'it is raining'.

Note: Northwest Caucasian **ʒ* = Proto-Indo-European **d^h*.

110. Proto-Indo-European **g^her-* 'hail' (unattested); (extended form) **g^hr-eH-t'-* 'hail': Old Church Slavic *gradъ* 'hail'; Czech (nom. pl.) *hrady* 'thundercloud'; Polish *grad* 'hail'; Russian *grad* [град] 'hail'; Serbo-Croatian *grȁd* 'hail'; Bulgarian *grad* 'hail'; (?) Sanskrit *hrādúni-ḥ* 'hail(-stone)'.

Northwest Caucasian: Common Abkhaz **ɣər-ʒə́* 'drizzle, drizzling rain': South Abkhaz *á-ɣər-ʒ* 'drizzle, drizzling rain' (**ʒə* 'water'), *á-la-ʒər-ʒ* 'tear' (**la* 'eye'); Abaza/Tapanta *ɣər-ʒə́* 'drizzle, drizzling rain', *ɣər-ʒ-ra* 'to drizzle'.

111. Proto-Indo-European **g^hey-* 'snow, ice, frost, winter': Albanian (Gheg) *dimën*, (Tosk) *dimër* 'winter'; Hittite (nom. sg.) *gi-im-ma-an-za* 'winter'; Armenian *jmeṙn* 'winter'; Greek χιών 'snow; snow-water, ice-cold water', χεῖμα 'winter-weather, cold, frost', χειμών 'winter; wintry weather, a winter storm'; Sanskrit *himá-ḥ* 'snow, frost, hoar-frost, winter', *hemantá-ḥ* 'winter, the cold season'.

Northwest Caucasian: Proto-Circassian **gəya* 'smooth (of ice)': Kabardian *məl-gay* 'smooth (of ice)' (*məl* 'ice').

112. Proto-Indo-European **Hn̥k^h-t^h-w/u-* 'the last part of the night, the time just before daybreak': Sanskrit *aktú-ḥ* (according to Mayrhofer 1956—1980.I:15, < **n̥ktú-*) 'the last part of the night, the darkness just before dawn'; Gothic **ūhtwō* 'dawn, early morning'; Old Icelandic *ótta* 'the last part of the night'; Old English *ūht* 'the time just before daybreak, early morning, dawn'; Old High German *uohta* 'daybreak, early morning'. Perhaps Vedic *aktā́* 'night', *aktós*, *aktúbhis* 'at night'. Perhaps also, with full-grade vowel: Lithuanian *ankstì*, *ankstiẽ*; *añkstas*, *ankstùs* 'early' (Žemaitian adverbs: *ankstáinais*, *ankstáiniais*, *ankstéinai(s)* 'very early'); Old Prussian *angstainai*, *angsteina* 'in the morning'.

Notes:
1. Relationship to **nek^{wh}-t^h-*/**nok^{wh}-t^h-* 'night' unclear.
2. Opinions differ greatly in the literature concerning whether or not all of the forms cited above belong together.

Northwest Caucasian: (1) Common Abkhaz **aqá* ‘night’: Bzyp (combined with numerals) *x̌-áx̌a* ‘three nights’; Ashkharywa (combined with numerals) *jə-x̌-aqa-x̌ə-wə-z-g'ə* ‘the third night’. (2) Common Abkhaz **w-aqá* ‘night’: Bzyp *wax̌á* ‘night’; Abzhywa *wax̌á* ‘night’; Abaza/Tapanta *waqá* ‘tonight’. (3) Common Abkhaz **w-aqə́* ‘at night’: Bzyp *wax̌ə́-n-la* ‘at night’; Abzhywa *wax̌ə́-n-la* ‘at night’; Abaza/Tapanta *waqə́-n-la* ‘at night’, *waqə́* ‘night’. (4) Common Abkhaz **j-aqá* ‘last night’: Bzyp *jax̌á* ‘last night’; Abzhywa *jax̌á* ‘last night’; Abaza/Tapanta *jaqá* ‘last night’; (5) Common Abkhaz **a-wá-qa* ‘at night’ (deictic **a-wá*, **aqá* ‘night’): Bzyp *awəx̌a* ‘at night’; Abzhywa *awáx̌a* ‘at night’; Ashkharywa *áwaq* ‘at night’; Abaza/Tapanta *áwaq* ‘at night’.

Note: Proto-Indo-European **o̯* is reflected as **a* in Northwest Caucasian.

113. Proto-Indo-European **ḫ̯we-y-/*ḫ̯wo-y-* ‘(vb.) to blow; (n.) wind’ (**ḫ̯ḫ* = **h₂*; *** = **h₁*): Sanskrit *vā́ti* ‘to blow (of wind)’, *vā́ta-ḥ* ‘wind, wind-god’, *vāyúṣ-* ‘wind, wind-god’; Gothic **waian* ‘to blow (of wind)’, *winds* ‘wind’; Old English *wāwan* ‘to blow (of wind)’; Old High German *wāen* ‘to blow (of wind)’; Lithuanian *vė́jas* ‘wind’, *vė̃tra* ‘storm, stormy weather’; Old Church Slavic *vějǫ*, *vějati* ‘to blow’, *větrъ* ‘storm’; Russian *véjat'* [веять] ‘to winnow, to blow’, *véter* [ветер] ‘wind’; Hittite *ḫuwant-* ‘wind’; Greek ἄ(ϝ)ησι ‘to blow (of wind)’; Latin *ventus* ‘wind’; Welsh *gwynt* ‘wind’; Tocharian A *want* ~ *wänt*, B *yente* ‘wind’.

Northwest Caucasian: Proto-Circassian **waya* ‘bad weather’: Bždedux *wāya* ‘bad weather (snow, rain, storm, cold)’; Kabardian *wāya* ‘bad weather (snow, rain, storm, cold)’. Circassian loans in: Abzhywa *a-wája* ‘bad weather, storm’; Abaza/Tapanta *wája* ‘bad weather, storm’. Note: This appears to be a later borrowing.

114. Proto-Indo-European **kʰay-wr̥-tʰ*, **kʰay-wn̥-tʰ* ‘cave, hollow’: Greek καιάδᾱς ‘pit or underground cavern’, καιετός ‘fissure produced by an earthquake’; Sanskrit *kévaṭa-ḥ* ‘cave, hollow’.

Northwest Caucasian: Proto-Circassian **kʰəya* or **kʰaya* ‘tub’: Bždedux *čʰ'əya* ‘tub’; Kabardian *kay* ‘tub’.

115. Proto-Indo-European **leh₁-u-s* (gen. sg. **leh₁-wo-s*) ‘stone’ (*** = **h₁*): Greek λᾶας, λᾶς (< *λᾱϝας) (gen. sg. λᾶος) ‘a stone, especially a stone thrown by warriors’, λεύω ‘to stone’, (Mycenaean) *ra-e-ja* ‘stone’; Old Irish *líe* (< **līwank-*) ‘stone’; Albanian *lerë* ‘heap of stones’. Note: This is a contested etymology. This makes it difficult to reconstruct the Proto-Indo-European form with absolute certainty. Cf. Matasović 2009:242; Pokorny 1959:683.

Northwest Caucasian: Common Abkhaz **ləwə́* ‘millstone’: Abaza/Tapanta *ləw* ‘handmill’; South Abkhaz *á-ləw* ‘millstone’ (indef. sg. *ləwə́-k’*); Ashkharywa *a-ʒə́-ləw* ‘watermill’; Feria *á-law* ‘millstone’.

116. Proto-Indo-European **meʔ-s-* ‘moon, month’ (variant: **meʔ-n-*) (**ʔ* = **ḫ₁*): Sanskrit *mā́s-* ‘moon, month’; Avestan *māh-* ‘moon, month’; Greek (Ionic) μείς, (Doric) μής, (Attic) μήν ‘moon, month’; Latin *mēnsis* ‘month’; Old Irish *mí* ‘month’; Welsh *mis* ‘month’; Gothic *mēna* ‘moon’, *mēnōþs* ‘month’; Old Icelandic *máni* ‘moon’, *mánaðr* ‘month’; Old English *mōna* ‘moon’, *mōnaþ* ‘month’; Old Church Slavic *měsęcь* ‘’moon, month’; Russian *mésjac* [месяц] ‘moon, month’; Czech *měsíc* ‘moon, month’; Lithuanian *mẽnuo* ‘moon, month’; Tocharian *mañ*, B *meñe* (< Proto-Tocharian **mēñē* < Proto-Indo-European **meʔ-nē(n)*) ‘moon, month’. Note: Proto-Indo-European **meʔ-s/n-* ‘moon, month’ is traditionally assumed to be a derivative of **meʔ-* (also written **meḫ₁-*, **mehı-*, **meḫ₁-*; **meγ-*; **mē-*; etc. in the literature) ‘to measure’ (cf., for example, Mallory—Adams 1997:385).

Northwest Caucasian:

A. Common Abkhaz **məz/ʒə́* ‘moon’: Bzyp *á-mza* ‘moon’ (indef. sg. *məz-k’ə́*); Abzhywa *á-mza* ‘moon’ (indef. sg. *məz-k’ə́*); Feria *á-məʒ/z* ‘moon’; Ashkharywa *á-məʒ* ‘moon’; Ahchypsy *á-məʒ* ‘moon’; Abaza/Tapanta *mzə* ‘moon’ (def. *a-məz*).
B. Ubykh *məʒə́* ‘moon, month’.
C. Proto-Circassian **maza* ‘moon, month’: Bžedux *māza* ‘moon, month’; Kabardian *māza* ‘moon, month’.

Note: Northwest Caucasian **z* = Proto-Indo-European **s*.

117. Proto-Indo-European **mel-t’-*/**mol-t’-*/**mḷ̊-t’-* ‘to melt, to liquefy, to soften’: Greek μέλδω ‘to soften by boiling’, βλαδύς ‘soft’; Sanskrit *mṛdú-ḥ* ‘soft, tender, mild’; Gothic **ga-maltjan* ‘to make melt away, to liquefy, to make dissolve’, *ga-malteins* ‘a melting away, dissolution’; Old Icelandic *moltinn* ‘soft, tender’, *melta* ‘to malt for brewing’; Old English *meltan* ‘to melt, to liquefy; to digest, to dissolve; to burn up’. Note: Ultimately derived from Proto-Indo-European **mel-*/**mol-*/**mḷ̊-* ‘to crush, to grind’.

Northwest Caucasian: Proto-Circassian **mələ* ‘ice’: Bžedux *mələ* ‘ice’; Kabardian *məl* ‘ice’.

118. Proto-Indo-European **merH-*/**morH-*/**mr̥H-* ‘to sparkle, to glisten, to gleam’: Hittite *marra-* or *marri-* ‘(sun)light’; Sanskrit *márīci-ḥ*, *marīcī* ‘ray of light (of the sun or moon); light; a particle of light’, *marīcin-* ‘possessing rays, radiant; the sun’; Greek μαρμαίρω, μαρμαρίζω ‘to flash, to sparkle, to glisten, to gleam’; Gothic *maurgins* ‘morning’; Old Icelandic *morginn* ‘morning’; Old

English *morgen*, *myrgen* ‘morning’; Old High German *morgan* ‘morning, tomorrow’; Belorussian *mríty* ‘to dawn, to grow light’.

Northwest Caucasian: Common Abkhaz **mará* ‘sun’: Bzyp *á-mra* // *á-mər(a)* // *á-mara* ‘sun’; Ahchypsy *á-mara* ‘sun’; Ashkharywa *á-mara* ‘sun’; Abaza/Tapanta *mará* ‘sun’.

119. Proto-Indo-European **pʰas-* ‘to strew, to sprinkle’ (only in Greek): Greek πάσσω (< *πάσ-τι̯-ω) (Attic πάττω) ‘to strew, to sprinkle’, πάσμα ‘sprinkling; (medic.) powder’, παστέος ‘to be besprinkled’, παστός ‘sprinkled with salt, salted’. Note: Not related to Latin *quatiō* ‘to move vigorously to and fro, to shake, to rock, to agitate’ (cf. Chantraine 1968—1980.II:860—861).

Northwest Caucasian: Common Abkhaz **psa-t’á* ‘to drizzle; dew’: South Abkhaz *a-(k’a-)psat’á* ‘to drizzle’; Abaza/Tapanta *pst’a* ‘dew’.

Note: Proto-Indo-European **pʰVs-* = Common Abkhaz **psV-*.

120. Proto-Indo-European **pʰéh̯h-ur-* [**pʰáh̯h-ur-*], **pʰəh̯h-wór-* ‘fire’ (**h̯h* = **H₂*): Hittite (nom.-acc. sg.) *pa-aḫ-ḫu-ur*, *pa-aḫ-ḫu-wa-ar*, *pa-aḫ-ḫur* ‘fire’, (gen. sg.) *pa-aḫ-ḫu-e-na-aš*; Luwian (nom. sg.) *pa-a-ḫu-u-ur* ‘fire’; Greek πῦρ ‘fire’; Umbrian *pir* ‘fire’; Gothic *fōn* ‘fire’, (gen. sg.) *funins*; Old Icelandic *fúrr* ‘fire’, *funi* ‘flame’; Old English *fȳr* ‘fire’; Old Saxon *fiur* ‘fire’; Old High German *fiur*, *fuir* ‘fire’; Tocharian A *por*, B *puwar* ‘fire’; Old Czech *púř* ‘glowing ashes, embers’; Armenian *hur* ‘fire’.

Northwest Caucasian:

A. Proto-Circassian **Pxăaq:ºa* ‘torch’: Kabardian *pxăq’ºa* ‘torch’.
B. (1) Common Abkhaz **pxă* ‘warm’: Abaza/Tapanta *pxă-rá* ‘to warm up, to become warm’; South Abkhaz *a-pxắ* ‘warm’, *a-pxă-ra* ‘to warm up, to become warm; to shine (of sun, moon)’. (2) Common Abkhaz **pxă-ʒə́* (< **pxă* ‘warm’, **ʒə* ‘water’): South Abkhaz *a-pxă-ʒə́* ‘sweat’; Abaza/Tapanta *pxă-ʒə* ‘sweat’. (3) Common Abkhaz **pxə-nə́* (< **pxă* ‘warm’, **-nə* ‘season, time of’): South Abkhaz *a-pxə-n* ‘summer’; Ashkharywa *a-pxə-n-ra* ‘summer’; Abaza/Tapanta *pxă-nə* ‘summer’, *pxən-č'əl'a* ‘July; middle of summer’.

Note: Proto-Indo-European **pʰVh̯h-* = Common Abkhaz **pxV-*.

121. Proto-Indo-European **pʰek’-*/**pʰok’-* ‘space, interval’ (only in Germanic): Old English *fæc* ‘space of time, division, interval’; Old Frisian *fek*, *fak* ‘niche’; Middle Dutch *vac* ‘compartment, section’; Old High German *fah* ‘wall, compartment’.

Northwest Caucasian: Proto-Circassian *$p^hak'a$ ‘stretch, interval, zone’: Temirgoy *pāč''a* ‘stretch, interval, zone’; Kabardian *pāka* ‘stretch, interval, zone’.

122. Proto-Indo-European *$p^h\check{e}s$-/*$p^h\check{o}s$- (with nasal infix *$p^h\check{e}ns$-/*$p^h\check{o}ns$-) ‘dust, sand’ (derivative of *$p^h\check{e}s$-/*$p^h\check{o}s$- ‘to crush, to grind, to pulverize’, preserved in Hittite [3rd sg. pres. act.] *pa-ši-ḫa-iz-zi* ‘to rub, to squeeze, to crush’ [< Luwian], [3 sg. pres. act.] *pé-eš-zi* ‘to rub, to scrub [with soap)’]: Luwian *pa/ušūriya-* ‘dust [?]’); Hittite [nom. sg.] *pa-aš-ši-la-aš* ‘stone, pebble; gem, precious stone (?)’, *paššilant-* ‘stone, pebble’, *paššuela-* ‘a stone object’; Sanskrit *pāṁsú-ḥ*, *pāṁsuká-ḥ* ‘dust, sand, crumbling soil’; Old Church Slavic *pěsъkъ* ‘sand’; Russian *pesók* [песок] ‘sand’.

Northwest Caucasian:

A. Common Abkhaz *$pš/čaħ^o/q^oá$ ‘sand; (sandy) seashore’: South Abkhaz *a-pšaħ^oá* ‘both sides of river shore; seashore’; Abaza/Tapanta *pxarčáq^oa* ‘sand’; Ashkharywa *pšaq^oa* ‘sand’. Chirikba (1996b:25) notes: “the actual etymology, the original form and even the genuine character of these forms are not clear”.
B. Ubykh *pšax^oa* ‘sand’.

Note: Proto-Indo-European *p^hVs- = Northwest Caucasian *$pšV$-.

123. Proto-Indo-European *$p^hr̥k^h$- ‘glowing embers, ashes’: Lithuanian *pirkšnìs* ‘glowing cinders’, *pir̃kšnys* ‘glowing ashes’; Old Irish (nom.-acc. pl.) *richsea* ‘live coals’; Breton *régez* ‘glowing embers’.

Northwest Caucasian: Common Abkhaz *pərɣá* ‘embers’: Abaza/Tapanta *pərɣá* ‘embers’; South Abkhaz *a-pərɣə́* ‘embers’.

124. Proto-Indo-European *$p'al\underset{\frown}{ħh}$-$t^ho$- ‘swamp, mud’ (*$\underset{\frown}{ħh}$ = *H_2): (?) Illyrian *balta* ‘swamp’ (> Albanian *baltë* ‘mud, clay, earth; swamp, marsh’, *balti* ‘mud’, *baltomë* ‘mud, filth’; Romanian *baltă* ‘swamp’; Modern Greek βάλτος ‘swamp’); Old Church Slavic *blato* (< *bolto-*) ‘quagmire, swamp’; Russian *bolóto* [болото] ‘marsh, bog, swamp’; Serbo-Croatian *blȁto* ‘mud, swampy terrain’; Czech *bláto* ‘mud’; Bulgarian *bláto* ‘mud, swamp’; Lithuanian *balà* ‘swamp’.

Notes:

1. Derksen (2008:53—54) reconstructs Proto-Balto-Slavic *bolʔto*. However, in light of the Northwest Caucasian parallel below, I would be more inclined to reconstruct *$\underset{\frown}{ħh}$ (= *H_2) as the laryngeal involved rather than *$ʔ$ (= *H_1).
2. The above forms are not derived from or related to Proto-Indo-European *b^helH- ‘bright, white, shining’.

Northwest Caucasian: Common Abkhaz **p'əlħatə* 'swamp, mud': South Abkhaz *a-p'əlħát* 'abyss, quagmire, mud'.

125. (1) Proto-Indo-European **seħ͡hʷ-* [**saħ͡hʷ-*] (unattested) 'to be or become hot, warm; to heat up, to make hot, to warm, to burn'; only found with the suffixes **-(e)l-*, **-(e)n-*: **seħ͡hʷ-(e)l-* (> **sāwel-*), **sħ͡hʷ-ōl-* (> **swōl-*), (**səħ͡hʷ-l-* >) **suħ͡hʷ-l-* (> **sūl-*); **sħ͡hʷ-en-* (> **swen-*), **səħ͡hʷ-n-* > **suħ͡hʷ-n-* (> **sūn-*), etc. 'the sun' (**ħ͡hʷ* = **ḫ₂ʷ*): Greek ἥλιος (Doric ἅλιος, ἀέλιος; Epic Greek ἠέλιος; Aeolian and Arcadian ἀέλιος; Cretan ἀβέλιος [that is, ἀϜέλιος]) (< **σᾱϜέλιος*) 'the sun'; Latin *sōl* (< **swōl-* < **sħ͡hʷ-ōl-*) 'the sun'; Old Irish *súil* 'eye'; Welsh *haul* 'the sun'; Gothic *sauil* (< Proto-Germanic **sōwilō*) 'the sun', *sugil* 'the sun', *sunnō* 'the sun' (< Proto-Germanic **sun-ōn*, with *-nn-* from the gen. sg. **sunnez* < **s(w)n̥-* < **sħ͡hʷ-n̥-*); Old Icelandic *sól* 'the sun', *sunna* 'the sun'; Old English *sōl* 'the sun', *sigel*, *segl*, *sægl*, *sygil* 'the sun', *sunne* 'the sun'; Old Saxon *sunna* 'the sun'; Old High German *sunna* 'the sun'; Lithuanian *sáulė* 'the sun'; Latvian *saũle* 'the sun'; Avestan *hvarə* 'the sun', (gen. sg.) *xᵛāng* (< **swen-s*); Sanskrit *svàr-* (*súvar-*) 'the sun', (gen. sg. *sū́raḥ*), *sū́rya-ḥ* 'the sun'. (2) Proto-Indo-European **sħ͡hʷ-elH-/*sħ͡hʷ-olH-/*sħ͡hʷ-l̥H-* (> **swelH-/*swolH-/*swl̥H-*) 'to burn': Greek εἴλη, ἕλη 'warmth, heat of the sun', ἀλέα (Ionic ἀλέη) 'warmth (of the sun), heat (of fire)'; Old English *swelan* 'to burn, to burn up; to inflame (of a wound)', *swol* 'heat, burning, flame, glow'; Old High German *swilizôn* 'to burn slowly'; Lithuanian (caus.) *svìlinti* 'to singe, to parch, to burn', *svįlù*, *svilaũ*, *svìlti* 'to scorch, to parch'.

Northwest Caucasian: Proto-Circassian **saxᵒa* 'ashes': Kabardian *sāxᵒa* 'ashes'.

126. Proto-Indo-European **t'eh-* [**t'ah-*] (> **t'ā-*) 'to flow', **t'eh-nu-* [**t'ah-nu-*] (> **t'ā-nu-*) 'flowing water; river, stream' (only in Indo-Iranian) (**h* = **ḫ₄*): Sanskrit *dā-na-m* 'the fluid flowing from an elephant's temples when in rut', *dā́-nu* 'a fluid, a drop, dew'; Avestan *dānuš* 'river, stream'; Ossetic *don* 'water, river'. Also used in various river names: Don (Russian Дон), Dniepr (Russian Днепр), Dniestr (Russian Днестр), Danube, etc.

Northwest Caucasian:
A. Common Abkhaz **t'a* 'diarrhea': Abzhywa *a-t'-rá* 'diarrhea'; Bzyp *a-t'a-rá* 'diarrhea'.
B. Ubykh *t'ə́* 'liquid, juicy'.

127. Proto-Indo-European **wel-/*wol-/*wl̥-* 'to moisten, to wet, to flow': (extended forms) **wel-kʰ-/*wol-kʰ-/*wl̥-kʰ-*; **wel-gʰ-/*wol-gʰ-/*wl̥-gʰ-*; **wel-k'-/*wol-k'-/*wl̥-k'-* 'to wet, to moisten': Old English *weolcen*, *wolcen* 'cloud'; German *Wolke* 'cloud'; Old Church Slavic *vlaga* 'moisture'.

Northwest Caucasian: Proto-Circassian **wala* 'cloud': Kabardian *wāla* 'cloud.

128. Proto-Indo-European **wer-/*wor-/*wr̥-* ‘to be turbulent, agitated, stirred up, raging’ (> ‘to strike or dash against’) (only in Greek: extended form: **wrāgʰ-* < **wr-eA-gʰ-* [*wr-aA-gʰ-*]): Greek (Ionic) ῥάσσω, (Attic) ῥάττω (< **Ϝρᾰ́χ-ιω*) ‘to strike, to dash, to push’; (Ionic) ῥηχίη, (Attic) ῥᾱχία ‘the sea breaking on the shore, especially the flood-tide; the roar of waves breaking on the shore’.

Northwest Caucasian: Proto-Circassian **warə* ‘wave; turbulent’: Temirgoy *warə* ‘wave; turbulent’; Kabardian *war* ‘wave; turbulent’.

XIV. Implements, Materials; Weapons, Warfare

129. Indo-European: Greek ἀξίνη ‘axe’; Latin *ascia* ‘axe’; Gothic *aqizi* ‘axe’; Old Icelandic *øx* ‘axe’; Old English *eax*, *æx*, *æsc* ‘axe’; Old Frisian *axa* ‘axe’; Old High German *acus*, *achus*, *accus*, *acchus*, *akis*, *ackes*, *acches* ‘axe’ (New High German *Axt*). Note: According to Liberman (2008:1—3), Old English *adesa*, *adese* ‘adze’ may belong here as well. Liberman derives *adesa*, *adese* from **acusa* (> **adusa* > **adosa* > *adesa*, with *d* substituted for *c*).

Notes:
1. Due to the contradictory nature of the evidence found in the various daughter languages, it is difficult to reconstruct the Proto-Indo-European form. This suggests a loanword.
2. The above Indo-European forms have also been compared with several somewhat similar Semitic forms (cf., for example, Beekes 2010.I:111; Kroonen 2013:19). This view has nothing to recommend it.

Northwest Caucasian: Common Abkhaz **aj-kʼºáɣa* ‘small axe’: Bzyp *ajkʼºáɣ(a)* ‘small, axe’; Abzhywa *ajkʼºáɣa* ‘small axe’; Abaza/Tapanta *kʼºáɣa* ‘small axe’; Ashkharywa (Apsua) *kʼºáɣa* ‘small axe’.

Notes:
1. The above forms may have been influenced by Common Abkhaz **ajx̌á* ‘iron, axe’ (> South Abkhaz *ajx̌á* ‘iron; axe; bit (of a horse)’; Abaza/Tapanta *ajx̌á* ‘iron; metal’; Ashkharywa *ájx̌a* ‘iron’).
2. To complicate matters, the following forms are also found: Common Abkhaz **aj-gºášºə* ‘small axe’: South Abkhaz *ajgºə́šº* ‘small axe’; Abaza/Tapanta *gºašº* ‘small axe’.

130. Proto-Indo-European **ʔn̥s-i-* ‘sword’ (**ʔ* = **ə₁*): Sanskrit *así-ḥ* ‘sword’; Avestan *aŋhū-* ‘sword’; Latin *ēnsis* ‘sword’ (almost exclusively poetical). Perhaps also Greek ἄορ ‘sword’ if from **ʔn̥s-r̥* (cf. Beekes 2010.I:112).

Northwest Caucasian: Common Abkhaz **aśa* ‘sword’: Bzyp *áśa* ‘sword, card (text.), feathers of a cock’s tail’, (poss.) *s-áśa* ‘my sword’; Abaza/Tapanta *sa* ‘beater (of weaver’s loom)’.

Notes:
1. Proto-Indo-European *$\underset{\circ}{n}$ is reflected as **a* in Northwest Caucasian.
2. Common Abkhaz **ś* = Proto-Indo-European **s*.

131. Proto-Indo-European (extended form) **hep^h-s-* [**hap^h-s-*]/**hop^h-s-* (vb.) ‘to cut, to split’; (n.) ‘that which cuts, splits’ (> ‘sword’ in Tocharian B); ‘cut, split’ (> ‘harm, injury; damage’ in Avestan) (**h* = *$\underset{\circ}{ə}_4$): Tocharian B *apsāl* ‘sword’; Avestan *afša-*, *afšman-* ‘harm, injury; damage’.

Notes:
1. The following forms have also been compared with the above: Lithuanian *opà* ‘wound, sore’, *opùs*, *ópus* ‘sensitive, susceptible to pain’; Sanskrit *apvā́* ‘name of a disease’.
2. According to Eric P. Hamp (1965a), the laryngeal *$\underset{\circ}{ə}_4$ is preserved initially in Albanian. If this is indeed the case, as Hamp claims, then Albanian *hap* ‘to open’ may be a derivative of the unextended Proto-Indo-European verb **hep^h-* [**hap^h-*]/**hop^h-* (vb.) ‘to cut, to split’, though this is not the etymology suggested by Hamp (1965a:125).

Northwest Caucasian: Common Abkhaz **ápśa* ‘bayonet, spear, lance’: Bzyp *ápśa* ‘bayonet, spear, lance’, (possessive) *s-ápśa* ‘my bayonet’; Abzhywa *ápsa* ‘bayonet, spear, lance’; Abaza/Tapanta *ħ^o-aps* ‘bayonet’. Note: The following alternative forms are also recorded: Bzyp *abś*; Abzhywa *absá*.

132. Proto-Indo-European **heyos-* [**hayos-*] ‘metal’ (**h* = *$\underset{\circ}{ə}_4$): Sanskrit *áyas-* ‘metal, iron’; Latin *aes* ‘crude, base metal, especially copper’, *aēneus* ‘made of brass, copper, or bronze’; Gothic *aiz* ‘brass, money, metal coin’; Old Icelandic *eir* ‘brass, copper’; Old English *ār*, *ǣr* ‘brass, copper’; Old Saxon *ēr* ‘ore’; Dutch *oer* ‘bog-ore’, *erts* ‘ore’; Old High German *ēr* ‘ore, copper’.

Northwest Caucasian: Common Abkhaz **ajx̌á* ‘iron; axe’: South Abkhaz *ajx̌á* ‘iron; axe; bit (of a horse)’; Abaza/Tapanta *ajx̌á* ‘iron; metal’; Ashkharywa *ájx̌a* ‘iron’. Note also: South Abkhaz *ajg^{o}ə́š^o* ‘small axe’; Abaza/Tapanta *g^{o}aš^o* ‘small axe’, *k’^{o}aɣa* ‘small axe’; Bzyp *ajk’^{o}áɣ(a)* ‘small axe’; Abzhywa *ajk’^{o}áɣa* ‘small axe’.

133. Proto-Indo-European **k^{h}at^h-* ‘fight, battle, war’: Sanskrit *śátru-ḥ* ‘enemy, foe, rival’; Old Irish *cath* ‘battle’; Welsh *cad* ‘war’; Old Icelandic (in compounds) *höð-* ‘war, slaughter’; Old English (in compounds) *heaðu-* ‘war, battle’; Old High German (in compounds) *hadu-* ‘fight, battle’; Old Church Slavic *kotora* ‘battle’; Hittite *kattu-* ‘enmity, strife’.

Northwest Caucasian: Proto-Circassian **k:at^{h}a* ‘sword’: Šapsegh *k:āt^{h}a* ‘sword’; Kabardian *gāta* ‘sword’.

134. Proto-Indo-European **k'eb^h-* 'bough, branch, stick': Lithuanian *žãbas* '(long) switch, dry branch', *žabà* 'rod, switch, wand'; Old Icelandic *kafli* 'a piece cut off', *kefli* 'a cylinder, stick, piece of wood'; Middle Dutch *cavele* 'stick, piece of wood used to throw lots'; Middle High German *kabel* 'lot'.

Northwest Caucasian: Common Abkhaz **q''aba* 'plowshare': Abaza/Tapanta *q''aba* 'plowshare'.

135. Proto-Indo-European **k'el-/*k'ol-/*k'l̥-* 'hole, hollow' (unattested): (extended forms) **k'leb^h-/*k'lob^h-/*k'l̥b^h-*; **k'lomb^h-* (in Slavic) 'hole, hollow' (> 'deep' in Slavic): Greek γλάφω 'to scrape up, to dig up, to hollow', γλάφυ 'a hollow, hole, cavern', γλαφυρός 'hollow, hollowed'; Old Church Slavic *glǫbokъ* 'deep'; Slovenian *globòk* 'deep', *globíti* 'to excavate', *glóbsti* 'to excavate, to carve'; Bulgarian *glob* 'eye socket'; Russian *glubókij* [глубокий] 'deep'.

Northwest Caucasian: (1) Common Abkhaz **k'ə́la-ć'^{ºə}* (< **k'əla* 'hole', **ć'^{ºə}* 'sharpened twig') 'wooden hook': Bzyp *a-k'ə́lać'^{º}* 'wooden hook for hanging clothes; plug, spigot in the middle of the yoke'; Abzhywa *a-k'lać'$^{ºə́}$* 'wooden hook for hanging clothes; plug, spigot in the middle of the yoke'. (2) Common Abkhaz **k'ə́la-ħa-ra* 'chink, little hole': South Abkhaz *a-k'ə́lħa-ra*//*a-k'ə́laa-ra* 'chink, little hole'.

136. Proto-Indo-European **k'^{w}eru-* 'spear, spit' (< 'round object'): Latin *veru* 'spit (for roasting)'; Umbrian (acc. pl.) *berva* '(roasting-)spit'; Avestan *grava-* 'staff'; Old Irish *bir*, *biur* 'spear, spit'; Welsh *ber* 'spear, lance, shaft, spit'.

Northwest Caucasian: Common Abkhaz **k'^{ºə}rə́* 'round object': Bzyp (indef. sg.) *k'^{ºə}rə́-k'* 'wheel', *a-k'^{ºə}rč''ə́ž'*, *a-k'$^{ºə́}$r-č''ə́ž'* 'small cart, wagon; small wheel', *a-k'^{ºə}rə́* 'roundish'; South Abkhaz *á-k'^{ºə}r-ra* 'to roll (of something small), to slide'; Abaza/Tapanta *r-k'^{ºə}r-ra* 'to pull, to drag', *qa-č^{º}-k'^{º}ra* 'bald-headed' (< *qa-č^{º}a* 'skin of the head' + **k'^{º}ra* 'round').

137. Proto-Indo-European **lek'-/*lok'-* 'to leak; to run, drip, or trickle out; to wet, to moisten': Old Irish *legaid* 'to melt, to melt away, to perish'; Welsh *llaith* 'moist, damp'; Old Icelandic *leka* 'to drip, to dribble, to leak', *leki* 'leakage, leak'; Norwegian *lekk* 'leak, leakage'; Middle Dutch *leken* 'to leak'; Old English *leccan* 'to water, to irrigate, to wet, to moisten'; Middle High German *lëchen* 'to leak', *lecken* 'to leak; to run, drip, or trickle out' (New High German *lecken*). Lenghtened-grade in: Proto-Germanic **lēkjōn-* 'rivulet' (?) > Faroese *lækja* 'well, waterhole, waterspout'; Norwegian *lækje* 'rivulet, wooden water-pipe'.

Northwest Caucasian: Common Abkhaz **lak'ára* 'wooden trough for spring water': Bzyp *a-lak'ár*, *a-lak'ára* 'wooden trough for spring water'. Semantic development as in Norwegian *lækje* 'rivulet, wooden water-pipe' cited above.

138. Proto-Indo-European **menk^{h}-/*monk^{h}-/*mn̥k^{h}-* ‘to pound, to grind, to press’: Sanskrit *mácate* ‘to pound, to grind’; Greek μάσσειν ‘to knead, to press into a mold’; Lithuanian *mìnkyti* ‘to knead, to mold’; Old Church Slavic *mękno̧ti* ‘to soften’; Russian *mjáknut'* [мякнуть] ‘to soften; to become soft, tender’.

Northwest Caucasian: Common Abkhaz **mák'a* ‘whetstone’: Bzyp *a'mák'(a)* “whetstone’; Abzhywa *a-mák'a* ‘whetstone’; Abaza/Tapanta *mak'a* ‘whetstone’.

Note: Proto-Indo-European **n̥* is reflected as **a* in Northwest Caucasian.

139. Proto-Indo-European **met^{h}-/*mot^{h}-* ‘(vb.) to twist, to turn; to weave together, to plait; (n.) **met^{h}-o-s*, **mot^{h}-o-s* ‘that which twists, turns; that which is turned, twisted’: Avestan *maθō* (adj.) ‘turning’; Armenian *matman* ‘spindle’; Lithuanian (pl.) *mẽtmens* ‘warp, groundwork’, (pl.) *mẽtmenys* ‘warp; thread-winder’, *matãras* ‘spindle’; Latvian, *mãtaras* ‘strap, belt, rope, thong; pole, lever’ (m. pl.) *meti* ‘warp, threads on a loom’.

Northwest Caucasian:
A. Common Abkhaz **máta* ‘a term referring to the processing of wool’: Abzhywa *a-máta-ra* ‘a term referring to the processing of wool’.
B. Proto-Circassian **mat^{h}a* ‘basket, beehive’: Bždux *māt^{h}a* ‘basket, beehive’; Kabardian *māta* ‘basket, beehive’.

140. Proto-Indo-European **mot^{h}-* ‘hoe’: Sanskrit *matyà-m* ‘harrow’; Latin *mateola* ‘a kind of mallet’ (diminutive of an unattested noun **matea* ‘hoe’); Old Church Slavic *motyka* ‘hoe’; Russian *motýka* [мотыка] ‘shovel, mattock; pick, picker; sickle’; Polish *motyka* ‘hoe’; Old English *mattoc* ‘mattock, pickaxe’. Note also: Proto-Indo-European **met^{h}-/*mot^{h}-* ‘to reap’: Latin *metō* ‘to reap, to harvest’; Welsh *medi* ‘to reap’.

Northwest Caucasian: Common Abkhaz **matá* ‘piece, strip of field to be plowed or hoed’: South Abkhaz *á-mata* ‘piece, strip of field to be plowed or hoed’.

141. Pre-Proto-Indo-European **p^{h}ek^{wh}-/*p^{h}ok^{wh}-* ‘to strike, to hit, to beat, to pound’ (> ‘to fight’ in Germanic): Hittite *pakkušš-* ‘to pound, to crack, to crush, to grind’, (adj.) *pak(kuš)šuwant-* ‘cracked (?)’. Proto-Germanic **feχtanan* ‘to fight’ > Old English *feohtan* ‘to fight, to combat, to strive; to attack, to fight against’, *feoht* ‘fight, battle; strife’; Old Frisian *fiuchta*, *fiochta* ‘to fight’; Old Saxon *fehtan* ‘to fight’; Old High German *fehtan* ‘to fight, to battle, to combat’, *gifeht*, *fehta* ‘fight, battle, combat’. Note: Proto-Indo-European **-k^{wh}-* > **-χ-* before **-t-* in Proto-Germanic (cf. Proto-Germanic **naχtz* ‘night’ [< **nok^{wh}t^{h}s*] > Gothic *nahts* ‘night’; Old Icelandic *nátt*, *nótt*

'night'; Old English *niht*, *næht*, *neaht* 'night'; Old Frisian *nacht* 'night'; Old Saxon *naht* 'night'; Old Dutch *naht* 'night'; Old High German *naht* 'night').

Northwest Caucasian: Proto-Circassian **pʰak:ºa* 'blunt': Bžedux *pʰāk:ºa* 'blunt'; Kabardian *pāgºa* 'blunt'. Apparent Kabardian loan (if not from **pə* 'nose', **agºa* 'short') in: South Abkhaz *a-págºa* 'dock-tailed, short; blunt, obtuse'; Abaza/Tapanta *pagºa* 'snub-nosed'.

142. Proto-Indo-European **pʰes-tʰo-*/**pʰos-tʰo-* 'fast, firm' (< **pʰes-*/**pʰos-* 'to tie or bind firmly together, to fasten'): Armenian *hast* 'firm, steady, standing still, tough', *hastoǰ* 'firmness, standing still, strength'; Gothic *fastan* 'to keep firm, to hold fast'; Old Icelandic *fastr* 'fast, firm', *festr* 'rope, cord'; Old English *fæstnian* 'to fasten, to fix, to secure, to bind', *fæst* 'fast, fixed, firm, secure'; Old Saxon *fast* 'fast, firm'; Old High German *fasto*, *faste* 'fast, firm', *festī*, *festīn* 'firmness, strength; shelter, stronghold, fortress'. Also Hittite (3rd sg. pres. act.) *pa-aš-ki* 'to stick in, to fasten, to plant; to set up; to impale, to stick'.

Northwest Caucasian:

A. Proto-Circassian **psə* 'string, cord, lace, strap, handle': Bžedux *-psə* 'string, cord, lace, strap, handle', *č''āpsa* 'string, rope'; Kabardian *psə* 'string, cord, lace, strap, handle', *k'āpsa* 'string, rope'; Temirgoy *λapsə* 'leather strap for tying up shoes, shoelace'.
B. Common Abkhaz **psa* 'to tie up': South Abkhaz *a-č-áj-də-psa-la-ra* 'to press, to lean against something', *a-gºə́-c'a-psa-ra* 'to press itself against somebody, to cross the hands at the bosom', *a-c'a-psa-ra* 'to bend, to kneel', *a-č-áj-k'ºa-psa-ra* 'to curl up, to fold up (wings)'; Abaza/Tapanta *pra-psá* 'curtain, apron', *pəra-psa-ra* 'to tie up through', *j-a-l-pəra-l-psa-d* 'she put on the apron' (literally 'she tied up the apron').
C. (?) Ubykh **psášx* 'glue'.

Note: Proto-Indo-European **pʰVs-* = Northwest Caucasian **psV-*.

143. Proto-Indo-European **pʰis-* (secondary full-grade forms in Baltic and Slavic) 'to crush, to grind' (with nasal infix **pʰi-n-s-*): Greek πτίσσω 'to pound or grind corn in a mortar', πτίσμα 'peeled or winnowed grain'; Sanskrit *pináṣṭi*, *piṁṣánti* 'to crush', *piṣṭá-ḥ* 'crushed'; Latin *pīnsō* 'to pound, to crush (grain or other materials)', *pistillus*, *pistillum* 'pestle'; Lithuanian *piẽstas* 'pestle'; Russian *pest* [пест] 'pestle', *pšenó* [пшено] (< Proto-Slavic **pьšenò*) 'millet'; Slovenian *pšano* 'millet'.

Northwest Caucasian: (1) Common Abkhaz **pš-qºə́-ć'ºə* 'corn-cob': Bzyp *á-pš-x̱ºə-ć'º* 'corn-cob'; Abzhywa *á-pš-x̌ºə-ć* 'corn-cob'. (2) Common Abkhaz **pšə* 'maize, millet': Abzhywa *á-pšə-r+ta* 'maize field', *a-pšə-c* 'maize grain', *á-pš* 'maize, millet'.

Note: Proto-Indo-European *p^his- = Common Abkhaz *$pšV$.

144. Proto-Indo-European *$p^hoʔ$-t^h-*lo-m* (> *$p^hō$-t^h-*lo-m*) ‘drinking-vessel’ (*$ʔ$ = *$ḫ_1$): Sanskrit *pā́tra-m* ‘drinking-vessel, goblet, bowl, cup’; Latin *pōculum* ‘a drinking-cup, goblet’. Note also: Hittite *pa-aš-zi* ‘to swallow, to gulp down’; Sanskrit *pā́tar-*, *pātár-* ‘one who drinks, a drinker’, *píbati* ‘to drink’; Latin *pōtō* ‘to drink’, *pōtus* ‘drunk’; Lithuanian *puotà* ‘feast, banquet, drinking-bout’.

Northwest Caucasian: Common Abkhaz *$pátx̌'a$ ‘horn used for drinking wine’: South Abkhaz *a-pátx̌'* ‘horn used for drinking wine’.

145. Proto-Indo-European *$seʔ(y/i)$- (> *$sē(y/i-)$) ‘(vb.) to sift; (n.) sieve’ (*$ʔ$ = *$ḫ_1$): Greek ἴθω, ἠθέω ‘to sift, to strain’, ἠθμός ‘a strainer’; Welsh *hidl* ‘sieve’; Old Icelandic *sáld* ‘sieve’, *sælda* ‘to sift’; Norwegian *saald* ‘sieve’, *sælda* ‘to sift’; Swedish *såll* ‘sieve’, (dial.) *sälda*, *sälla* ‘to sift’; Danish *saald*, *sold* ‘sieve’, (dial.) *sælde* ‘to sift’; Lithuanian *síetas* ‘sieve’, *sijóju*, *sijóti* ‘to sift’; Old Church Slavic *sějǫ*, *sěti* (*sějati*) in *pro-sějati* ‘to sift, to winnow’, *sito* ‘sieve’; Russian *sítо* [сито] ‘sieve, sifter, bolt, bolter, strainer’; Serbian *sȉjati* ‘to sift’, *sȉto* ‘sieve’. Note: The original meaning of Proto-Indo-European *$seʔ(y/i)$- may have been ‘to divide, to separate’.

Northwest Caucasian:

A. Common Abkhaz *sa ‘to cut out (material)’: South Abkhaz *a-sa-rá* ‘to cut out (material)’; Abaza/Tapanta *sa-rá* ‘to cut out (material)’. Perhaps also: (1) Common Abkhaz *sa ‘piece (of food)’: South Abkhaz *a-sá* ‘piece (of food)’. (2) Common Abkhaz *ssa ‘to cut in thin slices’: Bzyp *a-ssa-rá* ‘to cut in thin slices’; Abzhywa *a-r-ssa-ra* ‘to cut in thin slices’.
B. Proto-Circassian *sa ‘knife’: Bždedux *sa* ‘knife’; Kabardian *sa* ‘knife’.

146. Proto-Indo-European *$t^hek^h(s)$-/*$t^hok^h(s)$- ‘to form, to fashion, to make, to create, either by using a sharp tool or by bending, weaving, joining, braiding, or plaiting together’: Sanskrit *tákṣati* ‘to form by cutting, to plane, to chisel, to chop, to fashion, to make, to create’, *tákṣan-* ‘a wood-cutter, carpenter’; Pāḷi *tacchati* ‘to build’, *tacchēti* ‘to do woodwork, to chip’, *tacchanī-* ‘hatchet’, *tacchaka-* ‘carpenter’; Prakrit *takkhaï*, *tacchaï* ‘to cut, to scrape, to peel’; Avestan *tašaiti* ‘to produce, (carpenter) to make’, *taša-* ‘axe’; Latin *texō* ‘to weave, to build’; Greek τέκτων (< *τέκστων) ‘carpenter’, τέχνη (< *τέκσνᾱ) ‘art, craft’; Armenian *t^hek^hem* ‘to bend, to shape’; Old Irish *tál* (< *$tōks$-*lo-*) ‘axe’; Old Icelandic *þexla* ‘adze’; Old High German *dehsa*, *dehsala* ‘axe, poleaxe’ (New High German *Dechsel*); Lithuanian *tašaũ*, *tašýti* ‘to hew’; Old Church Slavic *tešǫ*, *tesati* ‘to hew’; Russian Church Slavic *tesla* ‘carpenter’s tool, adze’; Hittite (3rd sg. pres. act.) *ták-ki-(e-)eš-zi* ‘to join, to build’.

Northwest Caucasian: Proto-Circassian *t:aq:a ‘stump/handle, thick end of a pole’: Bždedux t:āq:a ‘stump/handle, thick end of a pole’; Kabardian dāq’a ‘stump/handle, thick end of a pole’.

147. Proto-Indo-European *t^herk^{wh}-/*t^hork^{wh}-/*$t^hr̥k^{wh}$- ‘to twist, to turn, to bend’: Latin *torqueō* ‘to twist, to bend, to wind’, *torquis* ‘twisted collar or necklace; collar of draft oxen; ring, wreath’; Sanskrit *tarkú-ḥ* ‘spindle’ (< *tark- ‘to twist, to turn’); Old Chruch Slavic *trakъ* ‘band, girdle’; Tocharian B *tärk-* ‘to twist around; to work (for example, wood)’, A *tark* ‘earring’; Hittite (3rd sg. pres. act.) *tar-uk-zi* ‘to dance’, (3rd pl. pres. act.) *tar-ku-an-zi*. Perhaps also Greek (Mycenaean) *to-ro-qe-jo-me-no* (*$trok^weyómenos$*) (meaning unknown).

Northwest Caucasian: Common Abkhaz *cárq^{o}ə ‘carpenter’s cord used to mark the line of cutting’: Bzyp *a-cárx̌^{o}* ‘carpenter’s cord used to mark the line of cutting’. For the semantics, cf. Buck 1949:§9.19 rope, cord.

Note: Common Abkhaz *c = Proto-Indo-European *t^h.

148. Proto-Indo-European *wed^h-/*wod^h- ‘to strike’: Sanskrit *vadh-* ‘to strike, to slay, to kill, to put to death, to destroy, to murder’, *vadhar-* ‘a destructive weapon, the weapon or thunderbolt of Indra’; Avestan *vadar-* ‘weapon (for striking)’; Lithuanian *vedegà* ‘adz’; Tocharian B *wät-* ‘to fight’.

Northwest Caucasian: Common Abkhaz *wadəšx̌x̌ə ‘(to break) into pieces’: South Abkhaz *a-wadəšx̌x̌ə-ra* ‘(to break) into pieces’.

XV. Sense Perception

149. Proto-Indo-European *b^heh-/*b^hoh- (> *$b^hā$-/*$b^hō$-) ‘to be bright, shining; to bring to light, to cause to appear; to make clear’ (*h = *$ḫ_4$): Greek φαίνω ‘to bring to light, to cause to appear; to make known, to reveal, to disclose; to make clear; to show forth, to display; to set forth, to expound; to inform against one, to denounce; to give light, to shine; to come to light, to become visible, to appear; to come into being; to come about; to appear to be’, φάω ‘to give light, to shine’, φάος, φῶς ‘light, daylight; light of the eyes’ (pl. φάεα ‘eyes’), φᾱνός ‘light, bright, joyous’; Sanskrit *bhā́ti* ‘to shine, to be bright, to be luminous; to be splendid or beautiful; to be conspicuous or eminent; to appear, to seem; to show one’s self, to manifest any feeling; to be, to exist’; Avestan *bānu-* ‘spendor’; Old Irish *bán* ‘white’; Old English *bōnian* ‘to polish’.

Northwest Caucasian: Common Abkhaz *ba ‘to see’: South Abkhaz *a-ba-rá* ‘to see’; Abaza/Tapanta *ba-rá* ‘to see’.

150. Proto-Indo-European *b^hel-/*b^hol-/*$b^hl̥$- ‘to glitter, to gleam, to shine’ > ‘to see, to look, to glance’: Old Icelandic *blik* ‘gleam, sheen’, *blika*, *blíkja* ‘to

gleam, to twinkle', *blígja* 'to gaze', *blígr* 'staring, gazing'; Swedish *bliga* 'to gaze (at, on, upon), to stare (at)', *blink* 'twinkle, twinkling, gleam, blink'; Middle English *blinken* 'to shine; to look at; to blink'; Old Frisian *blika* 'to appear, to be visible'; Dutch *blikken* 'to glitter, to twinkle; to look at, to look into, to glance at', *blik* 'regard, look, glance, view, glimpse', *blinken* 'to shine, to glitter'; New High German *blicken* 'to look', *Blick* 'glance', *blinken* 'to glitter, to gleam, to shine; to flash, to blink, to twinkle, to sparkle'. Non-Germanic cognates include: Tocharian B *pilko* 'insight, view; look, glance', A/B *pälk-* 'to see, to look at; to take heed of' also 'to shine, to be highlighted; to burn'; etc. Note: There are numerous derivatives of Proto-Indo-European *b^hel-/*b^hol-/*$b^hl̥$- 'to glitter, to gleam, to shine' in the Indo-European daughter languages — only a small sampling has been given here, specifically, those derivatives that deal with 'seeing, looking, glancing, etc.' For more information, the etymological dictionaries listed in the references should be consulted. See also the following entry.

Northwest Caucasian:

A. Common Abkhaz **bla* 'eye': South Abkhaz *á-bla* 'eye'; Ashkharywa *bla* 'eye'; Abzhywa *a-bá-bla* 'eye'. Note: Chirikba (1996b:19) suggests that the following may belong here as well: Common Abkhaz **bla-q''a* 'to stagger, to shake; to fall; to be bewildered' (**bla* 'eye' [?], **q''a* 'to beat, to strike'): South Abkhaz *á-blaq''a-ra* 'to stagger, to shake; to fall; to be bewildered'. However, semantically, the following are far better comparisons: (1) Common Abkhaz **balə́-* in **balə́-bata* 'to move with uncertainty': South Abkhaz *a-balə́bata-ra* 'to move with uncertainty'; and (2) *-bla-* // *-bəl-* in South Abkhaz *a-bla-xá-c'* // *a-bəl-xá-c'* 'giddiness, dizziness'.
B. Ubykh *blá* 'eye', *bladə́q̄'ᵒ* 'blink', *blawá* '(someone) who has the evil eye', **blax'amb̲á* 'nearsighted', *blamsá* 'eyebrow'.

151. Proto-Indo-European *b^hlend^h-/*b^hlond^h-/*$b^hlṇd^h$- 'to be or become blind': Gothic *blinds* 'blind', **gablindjan* 'to make blind', **afblindnan* 'to become blind'; Old Icelandic *blinda* 'to blind', *blindr* 'blind', *blunda* 'to shut the eyes', *blundr* 'dozing, slumber'; Old English *blendan* 'to blind, to deceive', *blind* 'blind'; Old High German *blint* 'blind'; Lithuanian *blendžiù*, *blę̃sti* 'to become dark', *blandùs* 'dark, dusky, obscure, gloomy, dismal', *blañdas* 'cloudiness, obscuration of mind or eyesight, drowsiness'; Old Church Slavic *blędǫ*, *blęsti* 'to go blindly'.

Northwest Caucasian:

A. (1) Common Abkhaz **bla-q''a* 'to stagger, to shake; to fall; to be bewildered': South Abkhaz *á-blaq''a-ra* 'to stagger, to shake; to fall; to be bewildered'. (2) Common Abkhaz **balə́-bata* 'to move with uncertainty': South Abkhaz *a-balə́bata-ra* 'to move with uncertainty'. (3) South Abkhaz *a-bla-xá-c'* // *a-bəl-xá-c'* 'giddiness, dizziness'. Note also: Common

Abkhaz **bla* ‘eye’: South Abkhaz *á-bla* ‘eye’; Abzhywa *a-bá-bla* ‘eye’; Ashkharywa *bla* ‘eye’.

B. Ubykh *blaɣ̄ºá* ‘blind’.

152. Proto-Indo-European **dʰes-*/**dʰos-* ‘to become numb’ (?) (only in Germanic): Old Icelandic *dasast* ‘to become weary and exhausted’, *dasaðr* ‘exhausted, weary’, *dæstr* ‘exhausted, worn out’; Danish *dase* ‘to lie idle’; Swedish *dasa* ‘to lie idle’; Middle English *dasen* ‘to benumb, to stun; to be stupefied, confused, bewildered’; Dutch *daas* ‘dizzy, confused, excited’.

Northwest Caucasian: Common Abkhaz **də́sə* ‘to become numb’: Bzyp *a-də́s-ra* ‘to become numb’; Abzhywa *a-də́s* ‘paralysis’.

153. Proto-Indo-European **hey-tʰro-* [**hay-tʰro-*] ‘bitter’ (**-tʰro-* is a suffix) (**h* = **ə₄*) (only in Lithuanian): Lithuanian *aitrùs* ‘bitter, sharp’, *aitrà* ‘tartness’.

Northwest Caucasian: Common Abkhaz **ajšá* ‘bitter’: Abaza/Tapanta *ajšá* ‘bitter’; Ashkharywa *ajšá* ‘bitter’; South Abkhaz *áša* ‘bitter’; Bzyp (indef. sg.) *(a)šá-k’* ‘bitter’.

154. Proto-Indo-European **met’-*/**mot’-* ‘to be mindful of’: Greek μέδομαι ‘to provide for, to care for, to be mindful of’; Latin *meditor* ‘to think about constantly, to contemplate, to ponder; to devise, to plan; to rehearse, to practice, to go over, to say to oneself’; Old Irish *midithir* ‘to measure, to judge’, *mess* ‘judgment’; Welsh *meddwl* ‘(vb.) to think, to mean; (n.) thought, meaning, opinion’, *meddylfryd* ‘mind, affection, bent’, *meddylgar* ‘thoughtful’; Cornish *medhes* ‘to say’; Gothic *mitōn* ‘to weigh in the mind, to consider, to meditate (upon), to reason about, to think over, to ponder, to cogitate’. Note: These forms are ultimately derived from Indo-European **met’-* ‘to measure’: Gothic *ga-mitan* ‘to measure out, to mete out, to apportion’, *mitaþs* ‘measure, measurement, standard of measure’; Old Icelandic *meta* ‘to estimate, to value’; Old English *metan* ‘to measure, to mete out, to mark off; to compare, to estimate’, *met* ‘measure, share, quantity; boundary, limit’; etc.

Northwest Caucasian: Common Abkhaz **mat’anájə* ‘to bow, to ask, to pray’: South Abkhaz *á-mat’anaj-ra* ‘to bow, to ask, to pray’; Bzyp *a-mat’anəj-ra* ‘to bow, to ask, to pray’, also ‘to mumble, to mutter’. Note: Assuming semantic development as in Latin *meditor* in the meanings ‘to rehearse, to practice, to go over, to say to oneself’ and Cornish *medhes* ‘to say’ cited above

155. Proto-Indo-European **mey-n-*/**moy-n-*/**mi-n-* ‘to think, to mean, to be of the opinion’, **mey-no-* ‘opinion, intention, view’: Old English *mǣnian* ‘to mean, to signify, to intend; to mention, to relate, to declare, to communicate, to say’; Old Saxon *mēnian* ‘to mean, to mention’; Dutch *menen* ‘to say’; Old High German *meinen* ‘to be of the opinion, to believe, to think, to suppose; to

reckon, to assert, to say, to suggest; to mean, to intend' (New High German *meinen*), *meina* 'meaning, intention, opinion, view' (New High German *Meinung*); Old Church Slavic *mĕnjǫ*, *mĕniti* 'to suppose, to think, to reckon, to mention'; Old Russian *mĕniti* 'to think, to suppose, to mention, to mean, to symbolize'. Note: The original meaning of the Proto-Indo-European unextended verb stem **mey-*/**moy-*/**mi-* may have been 'to perceive, to notice, to be aware of', preserved, for example, in Sanskrit *miṣáti* (< **mi-s-é-*) 'to open the eyes, to have the eyes open; to look at', *ni-meṣá-* (< **mey-s-*) 'twinkling of the eyes' (cf. Rix 2001:429 **meis-* 'to open the eyes'; Mayrhofer 1956—1980.II:641—642).

Northwest Caucasian: Common Abkhaz **majda* 'with content, awareness of somebody': South Abkhaz *á-majda* 'with content, awareness of somebody'.

XVI. Food and Drink

156. Proto-Indo-European **bʰes-* 'to crush, to grind (with the teeth)': Sanskrit (redup.) *bábhasti* 'to chew, to masticate, to devour'; Greek ψάω 'to rub, to grate, to scratch; to stroke, to wipe'. Note: Beekes (2010.II:1665—1666) considers the Greek forms he cites to be Pre-Greek in origin.

Northwest Caucasian: Common Abkhaz **(b)žaħºá* 'to ruminate': Abzhywa *á-žaħºa-ra* 'to ruminate', *a-žaħºá* 'cud, chewing'; Abaza/Tapanta *žaħºa-rá* 'to ruminate', *žaħºa* 'cud, chewing'; Bzyp *a-bžaħºa-rá* 'to ruminate'.

Note: Proto-Indo-European **bʰVs-* = Common Abkhaz **bžV-*.

157. Proto-Indo-European **kʼʷetʰ-u-* 'glutinous secretion, viscous discharge: gum, resin, sap' (< **kʼʷetʰ-*/**kʼʷotʰ-* 'to ooze [out], to seep [out]'): Sanskrit *játu-* 'lac, gum'; Latin *bitūmen* 'pitch, asphalt' (borrowed from either Sabellian or Celtic); Middle Irish *beithe* 'birch-tree' (borrowed from Brittonic Celtic); Old Icelandic *kváða* 'resin'; Faroese *kváða* 'viscous fluid from a cow's teat'; Old Danish *kvade* 'birch sap'; Norwegian *kvaade*, *kvae* 'resin; watery fluid from a pregnant cow's udder', (dial.) *kvæde* 'birch sap'; Old English *cwidu*, *cweodo*, *cwudu* 'resin, gum; cud, mastic'; Old High German *quiti*, *kuti* 'glue'. Note: In view of Faroese *kváða* 'viscous fluid from a cow's teat' and Norwegian *kvaade*, *kvae* 'resin; watery fluid from a pregnant cow's udder', Armenian *katʰn* 'milk' (dialectal variants include: Sučʰava *gatʰə*; Tbilisi *kátʰə*; Łabarał, Goris, Šamaxi *kátʰnə*; Loṙi *katʰə*; Agulis *kaxcʰ*; Havarik *kaxs*; Areš *kaxs*; Meɬri *kaxcʰ*; Karčewan *kaxcʰ*) may belong here as well. If so, then the traditional comparison of the Armenian form with Greek γάλα 'milk', Latin *lac* 'milk', etc. (cf. Martirosyan 2008:294—296) is to be abandoned.

Northwest Caucasian: Proto-Circassian *$k'^{o}ət^{h}(a)$ ‘to pour out, to pour into’: Bždeux *yə-$k'^{o}ət^{h}(a)$* ‘to pour out, to pour into’; Kabardian *yə-$k'^{o}ət(a)$* ‘to pour out, to pour into’ (*yə* = ‘hollow space’).

158. Proto-Indo-European **met'-*/**mot'-* ‘(vb.) to eat; (n.) food, meal’ (Germanic only): Gothic *mats* ‘food’, *matjan* ‘to eat, to feed’; Old Icelandic *matr* ‘meat, food’, *mata* ‘to feed another’; Old English *mete* ‘food’, *metsian* ‘to feed, to furnish with provisions’, *mettian* ‘to supply with food’; Old Saxon *meti* ‘food’; Middle Low German *met* ‘pork’; Old High German *maz* ‘food, nourishment’. Note: According to Kroonen (2013:358), Greek μεστός ‘full, filled, satiated’ belongs here as well. Kroonen derives μεστός from **med-to-s*.

Northwest Caucasian:

A. Common Abkhaz **mác'a* ‘locust; insatiable, gluttonous’: Abaza/Tapanta *mac'a* ‘locust; insatiable, gluttonous’; South Abkhaz *a-mác'a* ‘insatiable, gluttonous; locust’.
B. Ubykh *ma:c'á* ‘grasshopper’.
C. Proto-Circassian **mac'a* ‘locust’: Bždeux *māc'a* ‘locust’; Kabardian *māc'a* ‘locust’.

Note: Northwest Caucasian **c'* = Proto-Indo-European **t'*.

XVII. Clothing

159. Proto-Indo-European *k^{h}em-/*k^{h}om-/*$k^{h}m̥$- ‘(vb.) to cover, to conceal; (n.) covering; shirt’: Sanskrit *śāmulyà-ḥ* (Vedic *śāmūla-ḥ*) ‘thick woolen shirt’; Latin *camīsia* ‘linen shirt or night-gown’ (Gaulish loan ?); Gothic *-hamōn* in: *ana-hamōn*, *ga-hamōn* ‘to get dressed’, *af-hamōn* ‘to get undressed’, *ufar-hamōn* ‘to put on’; Old Icelandic *hamr* ‘skin, slough; shape, form’, *hams* ‘snake’s slough, husk’; Old English *hemeþ* ‘shirt’, *ham* ‘undergarment’, *-hama* ‘covering’ (only in compounds), *hemming* ‘shoe of undressed leather’; Old High German *hemidi* ‘shirt’, *-hamo* ‘covering’ (in compounds) ; Old Frisian *hemethe* ‘shirt’; Dutch *hemd* ‘shirt’.

Northwest Caucasian: Common Abkhaz **qamə* ‘fur coat’: Bzyp *a-x̱ʷamə́* ‘fur coat’; Abzhywa *a-xʷamə́* ‘fur coat’; Abaza/Tapanta *qamə́* ‘fur coat’.

XVIII. Qualities

160. Proto-Indo-European *b^{h}eng^{h}- ‘to swell, to increase’, *$b^{h}n̥g^{h}$-u- ‘swollen, fat, thick, dense; much, many; numerous, abundant’: Sanskrit *bahú-ḥ* ‘much, abundant; many, numerous; abounding in; frequent; large, great, mighty’, *baṁhate* ‘to grow, to increase’, (causative) *baṁhayati* ‘to cause to grow, to increase, to strengthen, to fix, to make firm’; Hittite (adj.; nom. sg.) *pa-an-ku-uš* ‘all (of), entire, complete; every’, (nom. sg.) *pa-an-ku-uš* ‘multitude, the

people, the masses'; Greek παχύς 'thick, stout, massive; fat, great'; Latvian *bìezs* 'thick'.

Northwest Caucasian:
A. Common Abkhaz **baɣ'á* 'thick, dense, solid, strong': South Abkhaz *a-baɣ'á* 'thick, dense, solid, strong'; Abaza/Tapanta *baɣ'á* 'hard, solid, strong; stingy (of men)'.
B. Ubykh *bɣ'ə́* 'wide, broad', *bɣ'ə́šʼ* 'width, breadth'.
C. Proto-Circassian **baɣə* 'to swell': Bžedux *baɣə* 'to swell'; Kabardian *baɣ* 'to swell'.

Notes:
1. Chirikba (1996b:14) writes Common Abkhaz **baγ'á*.
2. Kuipers (1975:12) writes Proto-Circassian **baĝə*.
3. Proto-Indo-European **ŋ̥* is reflected as **a* in Northwest Caucasian.

161. Proto-Indo-European **bʰoso-* 'bare, uncovered, naked': Old Icelandic *berr* 'bare, naked; (metaph.) uncovered, open, clear, manifest'; Old English *bær* 'bare, uncovered; naked, unclothed'; Old High German *bar* 'naked, bare' (New High German *bar*); Old Church Slavic *bosъ* 'barefoot, unshod'; Russian *bosój* [босой] 'barefooted, barelegged'; Lithuanian *bãsas* 'barefooted'.

Northwest Caucasian: Common Abkhaz **báša* 'simple, usual; in vain, for nothing': South Abkhaz *a-báša* 'simple, usual', *báša*, (redup.) *baša-máša* 'in vain, for nothing'; Ashkharywa *báša* 'in vain, for nothing'; Abaza/Tapanta (redup.) *baša-máša* 'simply, for nothing'.

Note: Common Abkhaz **š* = Proto-Indo-European **s*.

162. Proto-Indo-European **dʰes-/*dʰos-* 'to be or become weary, exhausted, worn out' (Germanic only): Old Icelandic *dasask* 'to become weary, exhausted', *dasaðr* 'weary, exhausted', *dasi* 'a lazy person', *dæstr* 'exhausted, worn out'; Middle English *darin* 'to stay in one place, to remain quiet; to lurk; to be motionless, inactive; to hesitate', *dasin* 'to become dizzy; to stupefy, to bewilder'; Middle Dutch *dasen* 'to rave, to be foolish', *daes* 'foolish'. Note: Kroonen (2013:91—92) reconstructs Proto-Germanic **dazēn-* 'to be numbed (?)'.

Northwest Caucasian: Common Abkhaz **də́sə* 'to become numb': Abzhywa *a-də́s* 'paralysis'; Bzyp *a-də́s-ra* 'to become numb'.

163. Proto-Indo-European **hegʰ-* [**hagʰ-*] '(to be) bad, evil; to (cause) harm' (**h* = **ḫ₄*): Sanskrit *aghá-ḥ* 'going wrong; mishap, evil; misdeed, a fault (sin, passion, impurity, pain, suffering); evil, bad, sinful, subject to passion, miserable, unclean', *aghávān* 'sinful'; Vedic *aghāyati* 'to be malicious, to sin,

to threaten'; Avestan *aγō* 'bad, evil'. Perhaps also: Gothic **agls* 'disgraceful', **agljan* 'to harm'; Old English *egle* 'troublesome; horrible, repulsive, hideous, loathsome; grievous, painful', *eglan* 'to trouble, to plague, to molest, to afflict'; Norwegian *egla* 'to bait, to goad, to heckle, to molest, to offend' *eglet(e)* 'cantankerous, quarrelsome'.

Northwest Caucasian:

A. (1) Common Abkhaz **ága* 'fool': South Abkhaz *ága* 'fool'; (2) Common Abkhaz **ga-ʒ́á* 'silly, fool': Bzyp *a-ga-ʒ́ə* 'silly, fool'; Abzhywa *a-ga-ʒá* 'silly, fool'. Note: Assuming semantic development as in Russian *durácкij* [дурацкий] 'foolish, silly', *durák* [дурак] 'fool, dupe, silly person; ass; simpleton, buffoon, clown; blockhead, dunce', *durít'* [дурить] 'to play the fool, to be foolish', *durét'* [дуреть] 'to grow stupid', *dur'* [дурь] 'obstinacy, folly, caprice, whim, extravagance' from the same stem found in *durnój* [дурной] 'ugly; bad; ill; unsightly, ill-favored; vile, base, wretched; evil, depraved'; etc.
B. Ubykh *ag'a* 'bad, evil'.

164. Proto-Indo-European (**k'en-*/**k'on-*/)**k'n-* 'knot, knob': Old Icelandic *knappr* 'knob', *knútr* 'knot'; Old English *cnop* 'knob', *cnotta* 'knot'; Middle Low German *knotte* 'knot, knob'.

Northwest Caucasian:

A. Proto-Circassian **k'ana*: Kabardian *k'āna* 'piece, lump'.
B. Common Abkhaz **k'ak'ánə* 'nut': Abaza/Tapanta *k'ak'an* 'nut'; South Abkhaz *a-k'ak'án* 'walnut'; Ashkharywa *k'ak'án* 'walnut'.

165. Proto-Indo-European **k'er-*/**k'or-*/**k'r̥-* in **k'or-skʰo-* 'lively, quick, bold, brisk, very much' (Germanic only): Proto-Germanic **karskaz* 'lively, quick, bold, brisk, very much' > Old Icelandic *karskr* 'brisk, bold; hale, hearty' (*era karskr maðr sá er …* 'he suffers much who …'); Danish *karsk* 'quick'; Swedish *karsk* 'bold'; Middle Low German *karsch* 'lively, fresh'; Dutch *kers-vers* 'new, fresh'; Middle High German *karsch* 'lively, fresh'.

Northwest Caucasian: Common Abkhaz **k'ara* 'much, extremely' in **k'ara-x̌a* 'to be extremely tired' (**x̌a* 'to work'): South Abkhaz *a-k'ara-x̌a-ra* 'to be extremely tired'.

166. Proto-Indo-European (extended form) **k'r-um-bʰ-*, **k'r-u-bʰ-* 'coarse, thick, big': Lithuanian *grubùs* 'uneven, rough'; Russian *grúbyj* [грубый] 'rough, coarse'; Czech *hrubý* 'big, coarse, rough'; Slovak *hrubý* 'thick, big, coarse'; Polish *gruby* 'thick, big, coarse'. Note also: Sanskrit *grathnā́mi*, *granthā́yati* 'to fasten, to tie or string together', *grathna-ḥ* 'bunch, tuft', *granthí-ḥ* 'a knot, tie, knot of a cord; bunch or protuberance'; Latin *grūmus* 'a little heap, hillock (of earth)'; Old Irish *grinne* 'bundle'; Old Icelandic *kring* 'round'; etc. Note:

According to Pokorny (1959:385—390), all of the above forms are ultimately derived from Proto-Indo-European **k'er-/*k'or-/*k'r̥-* (traditional **ger-/*gor-/*gr̥-*) 'to twist, to turn'.

Northwest Caucasian: Proto-Circassian **k''ərə* 'thick, dense (of wool, beard, etc.), long (of hair), high (of grass)': Bžedux *č''ərə* 'thick, dense (of wool, beard, etc.), long (of hair), high (of grass)'; Kabardian *k'ər* 'thick, dense (of wool, beard, etc.), long (of hair), high (of grass)'.

167. Proto-Indo-European **k'^{w}r̥H-u-* 'heavy, weighty; great, large, extended, long; grievous, serious; important, elevated': Sanskrit *gurú-ḥ* 'heavy, weighty; great, large, extended, long; high in degree, vehement, violent, excessive, deep, much; difficult, hard; grievous; important, serious, momentous; valuable, highly prized; dear, beloved; haughty, proud; venerable, respectable; best, excellent'; Latin *gravis* 'heavy, weighty, burdensome; important, elevated, dignified; grievous, painful, hard, harsh, severe, unpleasant'; Greek βαρύς 'heavy, weighty; impressive; difficult, wearisome, troublesome, oppressive'; Tocharian A *krāmärts*, B *kramartse* 'heavy', B *krāmär* 'weight, heaviness'.

Northwest Caucasian: Common Abkhaz **k'ʷərə́ćʷə* 'grown (up), upright, erect': South Abkhaz *-k'ʷərə́ćʷ-ʒa* (adv.) 'notably grown (up), having become taller; upright, erect'; Bzyp (Akhutsa) *a-pə́nć'a k'ʷə́ćʷ* // (Zwandrypsh) *k'ʷ(ə)rə́ćʷ* 'turned-up nose'.

168. Proto-Indo-European **mak'-* 'great, strong, mighty, powerful': Latin *magnus* (< **mak'(i)no-*) 'large, great, tall; outstanding, powerful, mighty', (adv.) *magis* 'more, to a greater extent, rather'; Albanian *madh* (< **mak'(H)-yo-*) 'big, large, tall'; Old Irish *maige* (< Proto-Celtic **mag-yo-*) 'great', (poetic) *mál* (< Proto-Celtic **mag-lo-*) 'noble, prince'.

Northwest Caucasian: Common Abkhaz **maq'á* 'strong, powerful, big, great': Abaza/Tapanta *maq'ə* 'strong, powerful, big, great'; South Abkhaz *a-maq'á*, *á-maq'-a* 'strong, powerful, big, great', *maq'ə́* 'old (of animals)'.

169. Proto-Indo-European **meʔ-/*moʔ-* (> **mē-/*mō-*); extended forms: **meʔ-is-/*moʔ-is-* (> **meis-/*mois-*); **meʔ-r-/*moʔ-r-* (> **mēr-/*mōr-*) 'great(er), large(r); more' (**ʔ* = **ḫ$_1$*): Gothic *maiza* 'greater, larger'; Old Icelandic *meiri* 'more'; Old English *māra* 'greater, more'; Old High German *mēro* 'more'; Old Irish *már*, *mór* 'great'.

Northwest Caucasian: Common Abkhaz **ma-za* (**ma* 'to have' ?) 'wealth, big amount of (valuable) possessions': South Abkhaz *a-mázа-ra* 'wealth, big amount of (valuable) possessions'; Ashkharywa (Apsua) *maza-rá* 'wealth, big amount of (valuable) possessions'.

170. Proto-Indo-European **melH-/*molH-/*mḷH-* ‘to wither, to fade, to weaken, to grow weary, to waste away’: Sanskrit *mlā́yati* ‘to wither, to fade, to decay; to be faint or languid, to grow weary, to languish; to become weak or feeble; to become thin or emaciated’, *mlāna-ḥ* ‘withered, faded, wearied, weary, wan; languid, languishing; enfeebled, emaciated, faint, feeble, weak’; Greek ἀμαλός ‘soft, weak’, μαλακός ‘soft, gentle, mild; weak, feeble’; New High German *mulsch* ‘weak’. Perhaps also: Hittite (nom. sg.) *mi-li-iš-ku-uš* ‘weak; light, unimportant’. Note: Ultimately derived from Proto-Indo-European **mel-/*mol-/*mḷ-* ‘to crush, to grind’.

Northwest Caucasian: Common Abkhaz **malá* ‘hunger’: South Abkhaz *á-mla* ‘hunger’; Ashkharywa *á-mala* ‘hunger’; Abaza/Tapanta *mla* ‘hunger’. Note: Semantic development from ‘thin, emaciated, wasted away (from hunger)’ (cf. Buck 1949:§5.14 hunger [sb.]).

171. Proto-Indo-European **men-t’-o-/*mon-t’o-/*mn̥-t’-o-* ‘slow, tardy, moving slowly or softly, loitering, inert, inactive, idle, lazy, laggardly’ (Sanskrit only): Sanskrit *manda-ḥ* ‘slow, tardy, moving slowly or softly, loitering, inert, inactive, idle, lazy, laggardly’.

Northwest Caucasian: Common Abkhaz **má-ra* ‘slowness; inefficiency, unproductiveness’ (**ma* ‘hand’, *-ra* abstract suffix): South Abkhaz *a-mára-ra* ‘slowness’, *a-mára* ‘inefficiency, unproductiveness’; Bzyp *a-mára* ‘efficiency, productiveness’, *á-mara-ra* ‘ability, capacity’.

Note: Proto-Indo-European **n̥* is reflected as **a* in Northwest Caucasian.

172. Proto-Indo-European **nek’ʷ-/*nok’ʷ-* ‘naked, bare, nude; exposed, without covering; open to view, not concealed; manifest, plain, evident’: Sanskrit *nagná-ḥ* ‘naked, nude, bare; uncultivated, uninhabited, desolate’; Latin *nūdus* ‘naked, nude, bare, unclothed; exposed, open to attack, lacking protection; having nothing added, plain, simple’; Old Irish *nocht* ‘naked, bare’; Gothic *naqaþs* ‘naked’; Old English *nacod* ‘nude, bare, not fully clothed; empty’; Lithuanian *núogas* ‘naked, bare, nude’; Hittite (nom. sg. c.) *ne-ku-ma-an-za* ‘naked (of humans and deities); uncovered (of horses)’, (3rd sg. pres. act.) *[n]e?-ku-ma-an-ta-iz-zi*, (3rd pl. pres. act.) *ni-ku-ma-an-da-ri-an-zi* ‘to undress oneself, to disrobe’.

Northwest Caucasian: Proto-Circassian **naq’ºa* ‘well-known, distinguisted; clear-cut, distinct’: Bždedux *nāʔºa* ‘well-known, distinguished’; Kabardian *nāʔºa* ‘well-known, distinguished; clear-cut, distinct’. Temirgoy also ‘to give oneself airs’. Semantic development from ‘exposed, without covering; open to view, not concealed; manifest, plain, evident’.

173. Proto-Indo-European **pʰoʔ(i/y)-* ‘to swell, to fatten’ (**ʔ* = **ḫ₁*): Sanskrit *páyate* ‘to swell, to fatten, to overflow, to abound’, *pī́van-* ‘swelling, full, fat’; Greek πῑ́ων ‘fat, rich’, πῖαρ ‘fat; any fatty substance, cream’; Old Icelandic *feitr* (< Proto-Germanic **faitaz*) ‘fat’, *feita* ‘to fatten’, *feiti* ‘fatness’; Old English *fǣtt* ‘fat’; Old Frisian *fatt*, *fett* ‘fat’; Old Saxon *feit* ‘fat’.

Northwest Caucasian: Abaza/Tapanta *pa-rá* ‘to rise (of dough)’.

174. Proto-Indo-European **p’elo-* ‘strong, powerful; big, large, great’: Sanskrit *bála-m* ‘power, strength, might, vigor; force, violence, rigor, severity’, *balín-* ‘powerful, strong, mighty, vigorous, stout, robust’; Greek βελτίων, βέλτερος, comparative of ἀγαθός, ‘better, more excellent’; Latin *dē-bilis* ‘feeble, weak’ (= *dē-* ‘without’ + **bilis* ‘strength’ [not otherwise attested in Latin]); Old Church Slavic *boljьjь* ‘bigger, better’; Russian *ból'šij* [больший] ‘greater’, *bol'šój* [большой] ‘big, large’.

Northwest Caucasian: Common Abkhaz (reduplicated) **p’ələ́-p’ələ* ‘to swarm, to teem with something’: South Abkhaz *a-p’ələ́p’əl-ra* ‘to swarm, to teem with something’.

175. Proto-Indo-European (prefix) **su-* ‘well, good’: Sanskrit *sú* (also *sū́* in the Rigveda) ‘good, excellent, right, virtuous, beautiful, easy, well, rightly, much, greatly, very, any, easily, quickly, willingly’ in *su-kṛt-á-ḥ* ‘a good or righteous deed, a meritorious act, virtue, moral merit; a benefit, bounty, friendly assistance, favor; good fortune, auspiciousness; reward, recompense’, *su-kṛ́t-* ‘doing good, benevolent, virtuous, pious; fortunate, well-fated, wise; making good sacrifices or offerings; skillful’, *su-kára-ḥ* ‘easy to be done, easy to be managed, easily achieving’, benevolence’, *su-kára-m* ‘doing good, charity, *su-divá-ḥ* ‘a bright or fine day’, *su-mánas-* ‘well disposed’, etc.; Greek ὐ- in ὐ-γιής ‘sound, healthy’, ὐ-γίεια ‘soundness, health’, etc.; Old Irish *su-*, *so-* ‘good’ in *so-chor* ‘good contract’, *su-aitribthide* ‘habitable’, *so-lus* ‘bright’, etc.; Welsh *hy-* in *hy-gar* ‘well-beloved, lovable’, *hy-dyn* ‘tractable’, *hy-fryd* ‘pleasant’, etc.; Old Icelandic *sú-* in *sú-svort* ‘nightingale’ (this word is obsolete in Icelandic); Lithuanian *sū-* in *sū-drùs* ‘luxuriant’, etc.; Old Church Slavic *sъ-* in *sъ-dravъ* ‘healthy’, *sъ-mrьtь* (< **su-mr̥tʰi-*) ‘death’, etc.

Northwest Caucasian: Proto-Circassian **ś’ᵒ(a)* ‘good’, **ś’ᵒəś’a* ‘beneficent; benefit, good deed’, **ś’ᵒəč''a* ‘gratitude’: Kabardian *f’ə* ‘good’, *f’əś’a* ‘beneficent; benefit, good deed’, *f’əś’a* ‘gratitude’; Bždedux *ś’ᵒə* ‘good’, *ś’ᵒəś’a* ‘beneficent; benefit, good deed’, *ś’ᵒəč''a* ‘gratitude’. Note: Kuipers (1975:32) writes **ṩᵒ(a)*.

176. Proto-Indo-European **t’es-*/**t’os-* ‘to become weak, exhausted’ (only in Sanskrit): Sanskrit *dásyati* ‘to suffer want, to waste away, to perish; to become exhausted; to be ruined’, *dasana-m* ‘wasting, perishing, destroying’.

Northwest Caucasian: Proto-Circassian **t'aSx̌a* 'to become weak/shaky': Temirgoy *t'āsx̌a* 'to become weak/shaky, unstable; vulnerable spot'; Kabardian *t'āsx̌a* 'to become weak/shaky, unstable; vulnerable spot'; Bždedux *t'ax̌sx̌ă* (< **t'aSx̌a*) 'weak, exhausted'. Circassian (Bždedux) loan in Abkhaz: South Abkhaz *a-t'áɣsa* 'weak, languid, exhausted (often of an ill person)'; Abaza/Tapanta *t'ax̌sa* 'not strong, weak, poor'.

177. Proto-Indo-European (adj.) **word*^{h}*-o-s* 'grown, full-grown, tall, upright', (adj.) **wr̥d*^{h}*-o-s* 'raised, upright, tall', (verb stem) **werd*^{h}*-*/**word*^{h}*-*/**wr̥d*^{h}*-* 'to raise, to elevate; to grow, to increase': Sanskrit *várdha-ḥ* 'increasing, growing, thriving', *vr̥ddhá-ḥ* 'grown, become larger or longer or stronger, increased, augmented, great, large; experienced, wise, learned; eminent in, distinguished by', *vr̥ddhi-ḥ* 'growth, increase, augmentation, rise, advancement'.

Northwest Caucasian: Proto-Circassian **warqːə* 'nobleman': Temirgoy *warqə* 'nobleman'; Kabardian *warq'* 'nobleman'. Note: These may be late loans from Indo-Aryan (personal communication from John Colarusso).

XIX. Speech, Language

178. Proto-Indo-European **b*^{h}*eʔg*^{h}*-*/**b*^{h}*oʔg*^{h}*-* (> **b*^{h}*ēg*^{h}*-*/**b*^{h}*ōg*^{h}*-*) 'to contend, to quarrel, to argue; conflict, strife, quarrel, argument' (*ʔ = **ḛ*$_{1}$): Old Icelandic *bágr* 'contest, strife, conflict', *bægja* 'to push back, to hinder; to treat harshly, to oppress; to quarrel'; Old High German *bāgan* (also *pāgan*) 'to contend, to quarrel, to argue, to squabble', *bāga* (also *pāga*) 'quarrel, *argblument'*; Old Irish *bágim* 'to fight, to contend, to quarrel', *bág* 'contest, contention, fight; boasting, vowing; vow, pledge, obligation, bond, alliance'; Latvian *buôztiês* 'to become angry'; Tocharian B *pakwāre* 'evil, bad; evil one'.

Northwest Caucasian: Common Abkhaz **bɣa* (< **bɢa*) 'prayer; to damn, to curse': Bzyp *a-bɣa-ra* 'prayer; to damn, to curse'. Note: Chirikba (1996b:17) writes Common Abkhaz **bγa*.

Note: Common Abkhaz **ɣ* = Proto-Indo-European **g*^{h}.

179. Proto-Indo-European **b*^{h}*el-*/**b*^{h}*l-* '(vb.) to babble, to chatter; (n.) idle talk, idle chatter': Tocharian A *plāc*, B *plāce* 'word, (idle) talk, speech; reply'. Perhaps also Greek φλεδών 'idle talk', φλέδων 'idle talker', φλεδονεύομαι 'to babble', φλέω (Hesychius) 'to babble', φληναφάω 'to chatter, to babble', φλήναφος, φλῆνος 'idle talk, nonsense; babbler'. Note: Beekes (2010.II:1577) considers these and several other Greek forms to be of Pre-Greek origin.

Northwest Caucasian: Common Abkhaz (reduplicated) **bəl-bəl* 'to chatter': Abaza/Tapanta *bəl-bəl-ra* 'to chatter'.

180. Proto-Indo-European *b^h*er-*/*b^h*or-*/*b^h*r̥-* ‘to make a sound, to hum, to buzz, to mutter’: Sanskrit *bambhara-ḥ* ‘bee’, *bambharālĭ̆-* ‘fly’; Armenian *boṙ* ‘bumble-bee, hornet’; Greek πεμφρηδών ‘a kind of wasp’; Lithuanian *barbĕ́ti* ‘to jingle, to clink’, *birbiù*, *birbiaũ*, *birt̃i* ‘to play a reed(-pipe)/flute’, *burbiù*, *burbĕ́ti* ‘to mutter, to mumble, to grumble’.

Northwest Caucasian:

A. (1) Common Abkhaz (reduplicated) **bar-bár* ‘(to) chatter, jabber, babble’: South Abkhaz *a-barbár-ra* ‘(to) chatter, jabber; babble’. (2) Common Abkhaz (reduplicated) **bər-bər* (a variant of **bar-bár*) ‘to grumble, to growl’: Abaza/Tapanta (adv.) *bər-bár-ħ^{o}a* (adv.) ‘growling, grumbling’; Abzhywa *d-bər-bər-wa* ‘be grumbling’.
B. Ubykh *bərsə́r* ‘noise, murmur, rumble (of a crowd)’.

181. Proto-Indo-European *b^h*es-* ‘to speak, to utter’ (Tocharian only): Tocharian B *päs-* ‘to speak, to utter’, *klautsaine päs-* ‘to whisper’. Note: According to Adams (2013:408), not derived from either Proto-Indo-European **pes-* ‘to blow’ or *b^h*es-* ‘to blow’.

Northwest Caucasian:

A. (1) Common Abkhaz **bəzə́* ‘tongue’: South Abkhaz *a-bz* ‘tongue’, (indef. sg. *bzə-k’*, *bzə-k’ə́*), *a-r-bza-ra* ‘to lick’; Ashkharywa *á-bəz* ‘tongue’; Abaza/Tapanta *bzə* ‘tongue’, (def. *á-bəz*; indef. sg. *bzə-k’*), *r-bza-rá* ‘to lick’; (2) Common Abkhaz **bəz-š^{o}á* ‘language’: Abaza/Tapanta *bəzš^{o}á* ‘language’; Ashkharywa *a-bəzš^{o}á* ‘language’; South Abkhaz *a-bəzš^{o}á* ‘language’; (3) Common Abkhaz **bəz-a(r)-ʒ́ə* ‘news, rumor; praise’: Bzyp *a-bzə́ʒ́* ‘news, rumor; praise’; Abzhywa *a-bza(r)ʒə́* ‘news, rumor; praise’; (4) Common Abkhaz **bəzə-r-ga* ‘to be put off (by too much praise)’ (**bəzə* ‘tongue’, *r-* causative, **ga* ‘to carry’): Bzyp *a-bzərga-ra* ‘to be put off (by too much praise); to perform an exorcism’. Circassian loan in: Bzyp *a-bzaməq’^{o}* ‘fool’; Abaza/Tapanta *bzaməq’^{o}* ‘having poor knowledge of a foreign language; dumb; unable to speak’; Akhutsa *á-bzaməq’^{o}* ‘fool’; Abzhywa *á-bzaməq’^{o}* ‘fool; deaf’. Note also: Ubykh *bża:mə́q̄’^{o}* ‘dumb, mute’.
B. Ubykh *bza* ‘speech, language’, *š'əbzá* ‘our language’, that is, ‘Ubykh’.
C. (1) Proto-Circassian **Pza* ‘language’: Bžedux *bza* ‘language’; Kabardian *bza* ‘language’; (2) Proto-Circassian **Pzag^{o}ə* ‘tongue’: Bžedux *bzag^{o}ə* ‘tongue’; Kabardian *bzag^{o}* ‘tongue’; (3) Proto-Circassian **Pzak:^{o}a* ‘dumb (without speech)’: Bžedux *bzāk:^{o}a* ‘dumb (without speech)’; Kabardian *bzāg^{o}a* ‘dumb (without speech)’; (4) Proto-Circassian **Pzay(a)* ‘to lick’: Bžedux *bzāya*, *bzayə* ‘to lick’; Kabardian *bzay* ‘to lick’.

Note: Proto-Indo-European *b^h*Vs-* = Proto-Circassian **PzV-*; Ubykh *bzV-*; Common Abkhaz **bVz-*, **bzV-*.

182. Proto-Indo-European *$g^{h}er$-/*$g^{h}or$-/*$g^{h}r̥$- ‘to growl, to wail, to weep, to cry (out)’ (onomatopoeic): Latin *hirriō* ‘to growl’; Armenian *ger* ‘to wail’; Gothic *grētan* ‘to weep, to lament’, *grēts* ‘weeping’; Old Icelandic *gráta* ‘to weep, to bewail’, *grátr* ‘weeping’; Swedish *gråta* ‘to weep’, *gråt* ‘weeping’; Old English *grǣtan* ‘to weep’, *grǣdan* ‘to cry out, to call out’; Old Saxon *grātan* ‘to weep’; Middle High German *grazen* ‘to cry out, to rage, to storm’.

Northwest Caucasian: Common Abkhaz (reduplicated) *ɣ'arə-ɣ'arə (onomatopoeic) ‘to rattle, to jingle; sound of beating or striking (against something); rattle, clapper’: South Abkhaz *a-ɣ'ar-ɣ'ár-ra* ‘to rattle, to jingle; sound of beating or striking (against something)’, *a-ɣ'ar-ɣ'ár* ‘rattle, clapper’; Abaza/Tapanta *ɣ'ar-ɣ'ár* ‘rattle, clapper; description of the sound produced by moving transport’.

Note: Common Abkhaz *ɣ = Proto-Indo-European *g^{h}.

183. Proto-Indo-European *$g^{wh}rem$-/*$g^{wh}rom$-/*$g^{wh}rm̥$- ‘to roar, to growl, to howl, to rage’: Latin *fremō* ‘to roar, to murmur, to growl, to rage, to snort, to howl’; Old English *grimman* ‘to rage, to fret, to roar, to cry out, to grunt’; Old Saxon *grimman* ‘to rage’; Old High German *grimmen* ‘to rage, to yell’. Note: The Latin form could be from Proto-Indo-European *$b^{h}rem$-/*$b^{h}rom$-/*$b^{h}rm̥$- ‘to roar, to growl, to howl’ instead (derivative of *$b^{h}er$-/*$b^{h}or$-/*$b^{h}r̥$- ‘to make a sound, to hum, to buzz, to mutter’ listed above).

Northwest Caucasian:

A. Common Abkhaz *g^{o}(ə)*rə́mə* ‘to groan, to grumble’: South Abkhaz *a-g^{o}rə́m-ra* ‘to grumble, to mumble’; Abaza/Tapanta *g^{o}rəm* ‘moan, groan’, *g^{o}rəm-ra* ‘to moan, to groan; to moo, to bellow (of animals)’.
B. Ubykh (reduplicated) *g^{o}ərg^{o}ə́rg^{o}* ‘the sound made by the rustling of water or the rumble of wheels’.

184. Proto-Indo-European *$k'er$-/*$k'or$-/*$k'r̥$- ‘to cry out, to call, to screech’: Sanskrit *járate* ‘to call out to, to address, to invoke; to crackle (fire)’; Crimean Gothic *criten* ‘to cry’; Old Icelandic *krutr* ‘murmur’, *krytja* ‘to murmur, to grumple’, *krytr* ‘noise, murmur’; Old English *ceorran* ‘to creak’, *ceorian* ‘to murmur, to grumble’, *ceorcian* ‘to complain’, *cracian* ‘to resound’, *crācettan* ‘to croak’, *crāwian* ‘to crow’; Old Saxon *krāian* ‘to crow’; Old High German *crāen*, *krāhen*, *chrāen*, *khrāen* ‘to crow’; Old Chruch Slavic *grajǫ*, *grajati* ‘to crow, to caw’.

Northwest Caucasian:

A. Proto-Circassian *k'ə(r)ğə ‘to squeak, to creak’: Bždux *č''ərğə* ‘to squeak, to creak’; Kabardian *k'əğ* ‘to squeak, to creak’.

B. Common Abkhaz (reduplicated) **k'ar-k'arə* 'to crackle': South Abkhaz *á-k'ark'ar-ra* 'to cackle'. Note: The Indo-European forms may also be compared with Common Abkhaz **q'ərə* 'to croak, to caw' (see below).

Northwest Caucasian: Common Abkhaz **q'ərə* 'to croak, to craw': South Abkhaz *a-q'ər-ra* 'to croak, to caw', (reduplicated) *á-q'ər-q'ər-ħa* description of loud laughter; Bzyp *a-q'rə́* 'a kind of bird'. Note: The Indo-European forms may also be compared with Proto-Circassian **k'ə(r)ğə* 'to squeak, to creak' and Common Abkhaz (reduplicated) **k'ar-k'arə* 'to cackle' (see above).

185. Proto-Indo-European **k'^{w}et^{h}-/*k'^{w}ot^{h}-* 'to say, to speak, to call: Armenian *koč̣em* (< **k'^{w}ot^{h}-y-*) 'to call, to invite, to invoke, to name', *koč̣* 'call, invitation'; Gothic *qiþan* 'to say'; Old Icelandic *kveða* 'to say'; Old English *cweþan* 'to say, to speak'; Old Frisian *quetha* 'to speak'; Old Saxon *queđan* 'to speak'; Old High German *quedan* 'to speak'.

Northwest Caucasian: Proto-Circassian **q'^{o}at^{h}a* 'to tell, to report; to announce, to make known': Bžedux *ʔ^{o}āt^{h}a* 'to tell, to report'; Kabardian *ʔ^{o}āta* 'to announce, to make known'.

186. Proto-Indo-European (reduplicated) (onomatopoeic) **p'ar-p'ar-* '(vb.) to babble, to prattle, to chatter, to jabber; (n.) unclear speech, gibberish': Sanskrit *barbara-ḥ* 'a blockhead, fool, barbarian, anyone not a Sanskrit speaker, not an Aryan'; Greek βάρβαρος 'barbarous, that is, not Greek, foreign', βαρβαρίζω 'to behave like a barbarian, to speak like one; to speak broken Greek, to speak gibberish', βαρβαρικός 'barbaric, foreign; like a foreigner'; Latin *barbarus* (Greek loan) 'of or belonging to a foreign country or region, foreign (from a Greek point of view)'.

Northwest Caucasian: Common Abkhaz (reduplicated) **p'ar-p'arə́* 'to chatter, to jabber' (onomatopoeic): South Abkhaz *a-p'ar-p'ar-rá* 'to chatter, to jabber', *a-p'ar-p'ár-j^{o}ə* 'chatterer'; Abaza/Tapanta *p'ar-p'ar* 'endless chatter'.

187. Proto-Indo-European **we$\underset{\smile}{\text{ʕ}}$-* [**wa$\underset{\smile}{\text{ʕ}}$-*]/**wo$\underset{\smile}{\text{ʕ}}$-* (> **wā-/*wō-*) 'to call, to cry out'(**$\underset{\smile}{\text{ʕ}}$* = **$_{2_3}$*): Greek ἠχή (< **ϝᾱχᾱ́*) 'sound, noise'; Latin *vāgiō* 'to cry, to whimper'; Gothic *wōpjan* 'to call, to cry out'; Old Icelandic *æpa* 'to cry, to shout; to call, to cry out (to someone)', *óp* 'shout, shouting; crying, weeping'; Old English *wēpan* 'to weep' (past participle *wōpen*), *wōp* 'weeping'; Old Frisian *wēpa* 'to cry aloud'; Old Saxon *wōpian* 'to bewail'; Old High German *wuoffen*, *wuofan* 'to bewail', *wuof* 'weeping, sobbing'; Old Church Slavic *vabljǫ*, *vabiti* 'to call, to entice'.

Northwest Caucasian:

A. (1) Common Abkhaz (reduplicated) **wə́wə* 'to howl': South Abkhaz *a-wwə́-ra* 'to howl'; Abaza/Tapanta *wə́w-ra* 'to howl', *wəw* 'howl'. (2)

Common Abkhaz **wáwə*: Abaza/Tapanta *waw* ‘cry’; South Abkhaz *a-wáw* ‘weeping, crying (at funerals)’.

B. Ubykh *wəw-* ‘to howl’, as in *áwa wəwə́n* ‘the dog is howling’.

188. Proto-Indo-European **wer-/*wor-* ‘to say, to speak, to tell’: Greek εἴρω (< **Ϝερι̯ω*) ‘to say, to speak, to tell’; Hittite (3rd sg. pres.) *ú-e-ri-ya-zi* ‘to invite, to summon, to name’; Palaic (3rd sg. pres.) *ú-e-er-ti* ‘to say, to call’; Latin *verbum* ‘word’; Gothic *waurd* ‘word’; Old Icelandic *orð* ‘word’, *orðigr* ‘wordy’, *yrða* ‘to speak’; Old English *word* ‘word’, *ge-wyrd(e)* ‘conversation’, *wordig* ‘talkative’; Old Saxon *word* ‘word’; Dutch *woord* ‘word’; Old High German *wort* ‘word’; Old Prussian (nom. sg. m.) *wīrds*, *wirds* ‘word’ (acc. sg. m. *wirdan*); Lithuanian *vardas* ‘name’.

Northwest Caucasian:

A. Common Abkhaz **war-š°sár* ‘to speak noisily, loudly’: Bzyp *a-war-š°ár* ‘to speak noisily, loudly’; Abaza/Tapanta *war-sár* ‘to speak noisily, loudly’.

B. Ubykh *wárada* ‘song, tune’, *wárada sq’án* ‘I sing’.

XXI. Numerals

189. Proto-Indo-European (**t’uʔʷ-o-*, **t’uʔʷ-i-* >) **t’(u)wo-*, **t’(u)wi-* ‘two’ (**ʔʷ* = **ḫ₁ʷ*): Sanskrit (m.) *dváu*, *dvā́* (Vedic also *duváu*, *duvā́*), (f./n.) *dvé* (Vedic also *duvé*), *dvi-* (in composition) ‘two’, *dviká-ḥ* ‘consisting of two’, *dvíḥ* ‘twice’; Avestan (m.) *dva*, (f./n.) *baē* ‘two’, *biš* ‘twice’; Greek δύω ‘two’ (uninflected δύο), δίς ‘twice, doubly’; Latin *duo*, (f.) *duae* ‘two’, *bīnī* ‘twofold, twice’, *bis* ‘twice’; Old Irish *dáu*, *dóu*, *dó* ‘two’, *dé-* (in composition) ‘two-, double’; Old Welsh *dou* ‘two’; Albanian (Gheg) (m.) *dy*, (f.) *dȳ* ‘two’; Gothic (m.) *twai*, (f.) *twōs*, (n.) *twa* ‘two’; Old Icelandic (m.) *tveir*, (f.) *tvær*, (n.) *tvau* ‘two’, *tvennr*, *tvinnr* ‘consisting of two different things or kinds, twofold, in pairs’, *tví-* (in compounds) ‘twice, double’, *tvisvar*, *tysvar* ‘twice’; Old English (m.) *twēgen*, (f./n.) *twā*, (n.) *tū* ‘two’, *twi-* (prefix) ‘two’, *twinn* ‘double’, *twiwa* ‘twice’; Old Frisian (m.) *twēne*, *tvēne*, (f./n.) *tva* ‘two’, *twi-* (prefix) ‘twice, double’, *twia* (adv.) ‘twice, double’; Old High German (m.) *zwēne*, (f.) *zwā*, *zwō*, (n.) *zwei* ‘two’, *zwi-* (prefix) ‘twice, double’; Lithuanian (m.) *dù*, (f.) *dvì* ‘two’; Latvian (m./f.) *divi* ‘two’; Old Prussian (m./f.) *dwai* ‘two’; Old Church Slavic (m.) *dъva*, (f./n.) *dъvě* ‘two’; Hieroglyphic Luwian *tuwa-* ‘two’; Lycian *kbi-*, (Milyan) *tbi-* ‘two’.

Northwest Caucasian:

A. Proto-Circassian **Tq’°(a)* ‘two’: Kabardian *t’ʔ°ə* ‘two (twice)’; Bždedux *t’°(a)* ‘two (twice)’; Temirgoy *t’°ə* ‘two’; Ubykh *t’q’°a* ‘two’. Note: In his 2007 review of Chirikba’s monograph *Common West Caucasian*, Sergej Starostin reconstructs Proto-Circassian **ṭʔʷə* ‘two’.

B. Abkhaz *ʕʷə* (< **tʕʷə* < **t'q'ʷə*) 'two' (personal communication from John Colarusso).
C. Ubykh *t'q'ʷá* 'two'.

XXI. Measurement

190. Proto-Indo-European **kʰan-dʰ-*(/**kʰn̥-dʰ-*) 'corner, edge, border': Albanian *këmd*, *kand* (m. pl. *këmde*, *kande*) 'corner, angle; seam, edge, border'; Greek κανθός 'corner of the eye'.

Notes:
1. According to Orël (1998:178), Albanian *këmd*, *kand* 'corner, angle; seam, edge, border' is an early borrowing from Proto-Slavic **kǫtъ* 'corner' (cf. Russian *kut* [кут] 'corner, blind alley'; Serbo-Croatian *kût* 'corner, angle'; Slovenian *kǫ́t* 'corner'; Bulgarian *kăt* 'corner, angle'; Czech *kout* 'corner'; Polish *kąt* 'corner'), while Meyer (1891:174) derives it from Italian *canto* 'corner, angle'. However, Derksen (2008:244) derives Proto-Slavic **kǫtъ* from Balto-Slavic **komp-* and compares Lithuanian *kam̃pas* 'corner, angle; nook', thus invalidating the comparison with Proto-Slavic **kǫtъ*.
2. The comparison of Albanian *këmd*, *kand* with Greek κανθός was suggested by Mann (1984—1987:470), who reconstructs Proto-Indo-European **kanthos*, *-us*; **kant-* 'side, edge, corner'. Mann reconstructs **-th-* to accommodate the Celtic and Balto-Slavic forms he includes in his etymology.
3. According to Beekes (2010.I:635—636) and Frisk (1970—1973.I:776—777), there is no Indo-European etymology for Greek κανθός 'corner of the eye'. Beekes assumes that it is Pre-Greek in origin. Boisacq (1950:406) reconstructs Proto-Indo-European **qanth-* and also compares Proto-Slavic **kǫtъ*, in addition to Welsh *cant* 'circle; rim, border, edge, boundary; tire, belt, girdle, girth' and Breton *kant* 'circle, disk', but this is questioned by Chantraine (1968—1980:I:492). Chantraine also mentions the possibility that Greek κανθός may be Pre-Greek in origin.
4. The comparison of Greek κανθός with the Celtic forms mentioned above has been rightly rejected. Thus, we are left with the Albanian and Greek forms as the only two possible candidates for inclusion here. Substrate origin cannot be ruled out for Greek κανθός, while Albanian *këmd*, *kand* may ultimately be a loanword after all, though none of the theories advanced so far are convincing.
5. Relationship to the following (Proto-Indo-European **kʰan-tʰ-*[/**kʰn̥-tʰ-*]) unknown.

Northwest Caucasian: Common Abkhaz **káda* 'side(s)': South Abkhaz *a-káda* 'side(s)'.

Note: Proto-Indo-European **n̥* is reflected as **a* in Northwest Caucasian.

191. Proto-Indo-European *k^han-t^h-(/*k^hn̥-t^h-) ‘rim, border, edge, boundary’ (Celtic only): Welsh *cant* ‘circle; rim, border, edge, boundary; tire, belt, girdle, girth’ and Breton *kant* ‘circle, disk’.

Notes:
1. Relationship to the preceding (Proto-Indo-European *k^han-d^h-[/*k^hn̥-d^h-]) unknown.
2. Not in Falileyev 2000 or Matasović 2009.

Northwest Caucasian: Common Abkhaz **qata* ‘side, edge’: Abaza/Tapanta *qata* ‘side, edge’.

Note: Proto-Indo-European *n̥ is reflected as **a* in Northwest Caucasian.

192. Proto-Indo-European *met^h-/*mot^h- ‘(vb.) to measure; (n.) measure, quantity’ (Baltic only): Lithuanian *mãtas* ‘measure, index; (dial.) size, quantity’, *mẽtas* ‘time, period; (pl.) year’, *matúoju*, *matúoti* ‘to measure’; Latvian *mę̃ts* ‘time, period’; Old Prussian *mattei* ‘measure’, *mettan*, *metthe*, *mette* ‘year’.

Notes:
1. Greek μέτρον (< *met^h-ro-*) ‘measure, goal, length, size, limit; meter’ (Greek loanword in Latin *metrum* ‘poetic rhythm, meter’) may belong here as well, assuming that it is derived from a different Proto-Indo-European root than that preserved in μήτρα ‘areal measure’ (cf. Sanskrit *má-tra-m* ‘measure, quantity, sum, size, duration, etc.’) (< Proto-Indo-European **meE-* ‘to measure’).
2. It appears that there were several different roots for ‘to measure’ in Proto-Indo-European: (1) **met'-* (traditional **med-*); (2) **meʔ-* (traditional **mē-*; **meə₁-*; **meh₁-*; **meγ-*; etc.); (3) *met^h-* (traditional **met-*). Cf. Derksen 2015:307.

Northwest Caucasian: Proto-Circassian **ma(r)t:a* ‘quantity, measure’: Temirgoy *māta* ‘quantity, measure’; Kabardian *mārda* ‘quantity, measure’. Note: Possible metathesis in Kabardian, in which case the Proto-Circassian form would have been **mat:(r)a*. This would be more compatible with the Indo-European forms cited above, especially Greek μέτρον.

XXII. Verb Stems

193. Proto-Indo-European *$ʔep^h$-/*$ʔop^h$- ‘to take, to grab’ (*ʔ = *ə₁): Latin *apīscor* ‘to seize, to grasp; to get, to obtain’, *apiō* ‘to tie, to fasten’; Hittite (3rd sg. pres. act.) *e-ep-zi* ‘to take, to seize, to grab, to pick, to capture’; Sanskrit *āpnóti* ‘to reach, to overtake’.

Northwest Caucasian: Common Abkhaz **apə-š'ə́* 'to connect, to bind': Bzyp *apə-š'-ra* 'to connect, to bind'; Abaza/Tapanta *ap-š'ə-l-ra* 'to connect, to bind' (*j-apə-l-š'ə-l-d* 'she connected it').

194. Proto-Indo-European **ʔey-/*ʔoy-/*ʔi-* 'to go' (**ʔ* = **ə₁*): Greek (1st sg. pres.) εἶμι 'I go', (1st pl. pres.) ἴμεν 'we go'; Sanskrit (1st sg. pres.) *émi* 'I go', (3rd sg. pres.) *éti* 'goes', (1st pl. pres.) *imáḥ* 'we go', (3rd pl. pres.) *yánti* 'they go', (3rd sg. pres.) *yā́ti* 'goes, moves, rides'; Latin (1st sg. pres.) *eō* 'I go'; Old Lithuanian (3rd sg. pres.) *eĩti* 'goes'; Old Prussian (3rd sg. pres.) *ēit* 'goes', *per-ēit* 'comes'; Old Church Slavic *idǫ*, *iti* 'to go'; Luwian (3rd sg. pres.) *i-ti* 'goes'; Hittite (imptv.) *i-it* 'go!'; Tocharian A (1st pl.) *ymäs* 'we go', B (1st sg.) *yam*, *yaṁ* 'I go'.

Northwest Caucasian: Common Abkhaz **jə* 'to come, to go': Abaza/Tapanta *ĥá-j-ra* 'to come', *na-j-ra* 'to go' (*na-* 'thither'); South Abkhaz *aá-j-ra* 'to come', *a-ná-j-ra* 'to go'.

195. Proto-Indo-European **bʰeʔ-/*bʰoʔ-* (> **bʰē-/*bʰō-*) 'to warm, to roast, to toast, to parch' (**ʔ* = **ə₁*): Greek φώγω (< **bʰō-k'-* < **bʰoʔ-k'-*) 'to roast, to toast, to parch'; Old High German *bāen*, *bājan* 'to warm by poultices, to foment, to toast (bread)'.

Northwest Caucasian: Common Abkhaz **ba* 'dry': South Abkhaz *a-ba-rá* 'to dry up'; Abaza/Tapanta *a-ba-rá* // *bá-x̌-ra* 'to dry up', *ba-x̌*, *ba-p* 'dry'.

196. Proto-Indo-European **bʰegʰ-* 'out, forth, outside', assuming development from an unattested root **bʰegʰ-* '(vb.) to rush, dash, or go out or forth; (n.) the outer side; (adj.) being outside, situated outside' (only in Sanskrit): Sanskrit *bahíḥ* 'out, forth, outside', (adj.) *bā́hya-ḥ* 'being outside, situated outside'. Possibly also the following: Old Church Slavic *bez*, *bezъ* 'without'; Russian *bez* [без] 'without, but, but for, had it not been' (Old Russian *bezъ* [безъ]); Czech *bez* 'without'; Polish *bez* 'without'; Serbo-Croatian *bȅz* 'without'; Lithuanian *bè* 'without'; Latvian *bez* 'without'; Old Prussian *bhe* 'without'. Note: Derksen (2008:38 and 2015:84) reconstructs Proto-Indo-European **bhe-ǵh* but does not cite Sanskrit *bahíḥ* as a possible cognate. Mayrhofer (1956—1980.II:424), on the other hand, lists the Balto-Slavic forms as possible cognates of Sanskrit *bahíḥ*. For a comprehensive discussion of the Slavic forms, cf. Trubačev 1974— .2:7—13.

Northwest Caucasian: Common Abkhaz **bga* 'to fall in/on, to crash down, to collapse; to rush, to dash, to dart somewhere': South Abkhaz *a-bga-rá* to fall in/on, to crash down, to collapse'; Bzyp *a-p'ga'-ra* 'to fall in/on, to crash down, to collapse'; Abaza/Tapanta *bga-ra* 'to fall in/on, to crash down, to collapse; to rush, to dash, to dart somewhere'. Note: For the semantics, cf. Proto-Indo-European **pʰetʰ-* 'to fall, to collapse' ~ **pʰetʰ-* 'to rush, to dash, to

flee’: Vedic *pátati* ‘to fly, to soar, to rush; to fall, to fall down, to fall off, to fall away’; etc.

197. Proto-Indo-European **bʰel-/*bʰol-* ‘to burn, to blaze’: (1) Proto-Indo-European (extended form) **bʰlek’-/*bʰlok’-/*bʰl̥k’-*, **bʰelk’-/*bʰolk’-/*bʰl̥k’-* ‘to burn, to blaze, to glow’: Sanskrit *bhárgas-* ‘splendor, radiance’; Greek φλέγω ‘to burn, to blaze’; Latin *fulgor* ‘lightning’, *flagrō* ‘to blaze, to burn, to glow’; Old Icelandic *blakkr* ‘dusky, black, dun’; Old English *blæc* ‘black’, *blǣcern*, *blācern* ‘lantern’; Old High German *blah-*, *blach-* ‘black’ (in compounds); Old Church Slavic *blagъ* ‘good’. (2) Proto-Indo-European (extended form) **bʰlu-*, **bʰlu-H-* (> **bʰlū-*) ‘to burn, to blaze, to light up’: Old Icelandic *blys* ‘torch’; Old High German *bluhhen* ‘to burn, to light up’; Old English *blysa* ‘torch, fire’; Middle Irish *blosc* ‘clear, evident’, *bloscad* ‘radiance’; Czech *blčeti* ‘to flash, to blaze’, *blýskati* ‘to lighten, to flash’; Polish *błysk* ‘lightning’.

Northwest Caucasian:

A. Proto-Circassian **Pla* ‘to burn, to shine (intr.)’: Bždedux *bla* ‘to burn, to shine (intr.)’; Kabardian *bla* ‘to burn, to shine (intr.)’.
B. Common Abkhaz **bələ́* ‘to burn’: Abaza/Tapanta *bəl-rá* ‘to burn, to put into fire’, *blábəl* ‘very hot’, (reduplicated) *blábəl-ra* ‘to be (very) hot; to burn (of a burn)’, *a-blə́-ra* ‘the place of burn, fire’; Bzyp *a-blə́-ra* ‘the place of burn, fire’; South Abkhaz *a-bəl-t’ºə́* ‘firewood’, *a-bəl-rá* ‘to burn, to put into fire’; Ashkharywa *a-bəl-t’á* ‘firewood’.

198. Proto-Indo-European **bʰel-/*bʰol-/*bʰl̥-* ‘to glitter, to gleam, to shine’: Greek φλέγω ‘(trans.) to burn, to scorch; (pass.) to become hot, to blaze up; (metaph.) to kindle, to inflame; to make to blaze up, to rouse up, to excite; (intr.) to flame, to blaze, to flash; to burst or break forth; to shine forth’; Latin *fulgeō* ‘to lighten; to shine, to gleam, to glitter’, *fulgur* ‘lightning, thunderbolt’; Lithuanian *bãlas* ‘white’, *bálnas* ‘white’, *báltas* ‘white’, (dial.) *blìzgas* ‘shine, glimmer’, *blizgėti* ‘to shine, to sparkle’, *blyškėti* ‘to shine’; Old Church Slavic *bělъ* ‘white’; Russian *bélyj* [белый] ‘white, clean’, *belít'* [белить] ‘to whiten; to bleach, to blanch; to whitewash’. Note: For additional derivatives of Proto-Indo-European **bʰel-/*bʰol-/*bʰl̥-* ‘to glitter, to gleam, to shine’, see the preceding entries.

Northwest Caucasian: Kabardian *blan* [блэн] ‘to shine’ (cf. Djahukyan 1967:103). Note: For additional Northwest Caucasian cognates, see the preceding entries.

199. Proto-Indo-European **bʰen-* ‘to slay, to wound’: Gothic *banja* ‘strike, blow, wound’; Old Icelandic (f.) *ben* ‘mortal wound; small bleeding wound’; Old English *bana* ‘killer, slayer, murderer’, *benn* ‘wound, mortal injury’; Old High German *bano* ‘death, destruction’; Avestan *bąn-* ‘to make ill, to afflict’.

Northwest Caucasian: Proto-Circassian **ban(a)* ‘to fight’: Bždedux *ya-ban* ‘to fight’; Kabardian *bāna*, *ya-ban* ‘to fight’.

200. Proto-Indo-European **bʰer-/*bʰor-/*bʰr̥-* ‘to fall, to fall down’ (extended form **bʰrekʰ-/*bʰrokʰ-/*bʰr̥kʰ-*) (only in Sanskrit): Sanskrit *bhṛśyati* ‘to fall, to fall down’, *bhraśyate*, *bhráṁśate* ‘to fall, to tumble, to drop or fall down, to fall out’.

Northwest Caucasian:
A. Common Abkhaz **bər(tə)* ‘to reel, to stagger; to be confused, bewildered’: South Abkhaz *á-bər-ra* ‘to stagger, to reel; to be confused, bewildered’; Abaza/Tapanta *bərt-rá* ‘to reel, to stagger’.
B. Ubykh *bar-* ‘to stumble, to slip’.

201. Proto-Indo-European **bʰes-/*bʰos-* ‘to breathe, to blow’: Sanskrit *bhas-* ‘to breathe, to blow’ in: *bhásma-ḥ*, *bhásman-* ‘ashes’, *bhāsmana-ḥ* ‘made of or consisting of ashes, ashy’, *bhasita-ḥ* ‘reduced to ashes’, *bhastrā* ‘leather bag, bellows’.

Northwest Caucasian: Common Abkhaz **bza* ‘alive, life’: South Abkhaz *a-bzá* ‘alive’, *a-bzá-za-ra* ‘life’; Abaza/Tapanta *bza* ‘alive’, *bzá-za-ra* ‘life’.

Note: Proto-Indo-European **bʰVs-* = Common Abkhaz **bzV-*.

202. Proto-Indo-European **bʰewH-/*bʰowH-/*bʰuH-* (> **bʰū-*) ‘to come into being, to become, to arise’: Sanskrit *bhávati* ‘to become, to be, to arise, to come into being, to exist’, *bhū́ti-ḥ*, *bhūtí-ḥ* ‘well-being, prosperity, wealth, fortune’; Greek φύω ‘to bring forth, to produce, to put forth; to grow, to increase, to spring up, to arise’; Latin (perfect) *fuī* ‘to be, to exist’; Old English *bēon* ‘to be, to exist, to become, to happen’; Old Frisian (1st sg. pres.) *bim* ‘(I) am’; Old Saxon (1st sg. pres.) *bium*, *biom* ‘(I) am’; Old High German (1st sg. pres.) *bim* ‘(I) am’ Lithuanian *bū́ti* ‘to be, to exist’, *bū̃vis* ‘existence’; Russian *byt'* [быть] ‘to be’; Old Church Slavic *byti* ‘to be’; Serbo-Croatian *bȉti* ‘to be’.

Northwest Caucasian: Proto-Circassian **baw(a)* ‘to kiss, to breathe’: Bždedux *ya-bawə*/*bāwa*, *ya-baw* ‘to kiss, to breathe’; Temirgoy *bawa-n* ‘to kiss, to breathe’.

203. Proto-Indo-European **bʰit'-* ‘to split, to cleave’ (also, with *n*-infix, **bʰint'-*): Sanskrit (1st sg.) *bhinádmi* ‘to split, to cleave, to pierce’ (3rd pl. *bhindánti*); Latin *findō* ‘to split, to cleave, to separate, to divide’. Full-grade (**bʰeyt'-*) in: Gothic **beitan* ‘to bite’; Old English *bītan* ‘to bite; to cut, to wound’.

Northwest Caucasian: Common Abkhaz **bć'a* ‘to reap, to crop’: Abzhywa *a-bc'a-rá* ‘to reap, to crop’; Bzyp *a-bć'a-rá* ‘to reap, to crop’. Perhaps also:

Common Abkhaz **bəć'ə́* 'to crumble, to crumple, to rumple': Abaza/Tapanta *r-bc'-rá* 'to crumble, to crumple, to rumple'; Bzyp *a-r-bć'-rá* 'to crumble, to crumple, to rumple'; Abzhywa *a-r-bəc'-rá* 'to crumble, to crumple, to rumple'.

Note: Common Abkhaz **ć'* = Proto-Indo-European **t'*.

204. Proto-Indo-European **dʰeʔ-*/**dʰoʔ-* (> **dʰē-*/**dʰō-*) 'to put, to place' (**ʔ* = **ə₁*): Sanskrit (reduplicated) *dadhā́ti* 'to put, to place, to set, to lay'; Greek (reduplicated) τίθημι 'to set, to put, to place'; Latin *faciō* 'to make, to build, to construct (from parts, raw materials, etc.)'; Old English *dōn* 'to make, to act, to perform; to cause'; Old High German *tuon* 'to do, to make'; Lithuanian *dedù*, *dė́ti* 'to put, to place, to lay'; Hittite (3rd sg. pres. act.) *da-a-i* 'to lay, to put, to place'; Tocharian A *tā-*, B *täs-*/*tättā-* 'to put, to place, to set'.

Northwest Caucasian: Common Abkhaz **də* 'to join or attach together': South Abkhaz *á-d-ra* 'to instruct, to commission someone to do something; to attach something/someone to', (preverb) *d(ə)-* 'to attach; doing or being before something', *aj-d-ra* 'to be together'; Abaza/Tapanta (preverb) *d(ə)-* 'to attach; doing or being before something'.

205. Proto-Indo-European **dʰer-*/**dʰor-*/**dʰr̥-* 'to hold firmly, to support', **dʰer-mo-s* 'firm, strong': Sanskrit *dhāráyati* 'to hold, to bear, to carry; to hold up, to support, to sustain, to maintain; to carry on; to hold in, to hold back, to keep back, to restrain, to stop, to detain, to curb, to resist; to keep, to possess, to have; to hold fast, to preserve', *dhárma-ḥ* 'that which is held fast or kept: ordinance, statute, law, usage, practice, custom, customary observances; religion, piety; prescribed course of conduct, duty'; Avestan *dar-* 'to hold'; Old Persian (1st sg.) *dārayāmiy* 'to hold'; Latin *fīrmus* 'strong, steadfast, stable, enduring, powerful', *firmō* 'to make firm, to strengthen, to fortify, to sustain; to confirm, to establish, to show, to prove, to declare, to make certain' (derivative of *firmus*); Lithuanian *daraũ*, *dariaũ*, *darýti* 'to do'; Latvian *darît* 'to do'.

Northwest Caucasian: Common Abkhaz **dára* 'to strengthen; very (much)': Bzyp *dáara*, *daára*, *dára* 'very (much)'; Ashkharywa *adára* 'very (much)'; Sadz *adára* 'very (much)'; Abaza/Tapanta *dára* 'stingy (man)', *r-dára-ra* 'to strengthen', *dára* 'very much'.

206. Proto-Indo-European **dʰer-* 'to twist, to turn (round)' (unattested): (extended forms) **dʰer-gʰ-*/**dʰor-gʰ-*/**dʰr̥-gʰ-*, **dʰr-egʰ-*/**dʰr-ogʰ-*/**dʰr̥-gʰ-* 'to twist, to turn (round)': Greek τρέχω 'to run, to move quickly', τροχός 'wheel', τρόχος 'a running course', τροχιός 'round'; Armenian *daṙnam* (< **darjnam*) 'to turn, to return', *durgn* 'a potter's wheel'; Albanian *dredh* 'to twist, to turn'; Old Irish *droch* 'wheel', *dreas* 'turn, course'. Note: For the semantic development of Greek τρέχω, cf. Old Irish *rethid* 'to run', *riuth* 'running', *roth* 'wheel', *rothán* 'the hair twisted and plaited' < **retʰH-*/**rotʰH-* 'to roll, to revolve, to turn'.

Northwest Caucasian: (1) Common Abkhaz **darə́* ‘to spin’: South Abkhaz *á-dar-ra* ‘to spin with a double thread’. (2) Common Abkhaz (reduplicated) **da(r)dərə́* ‘spindle’: South Abkhaz *a-dardə́*/*a-dərdə́* ‘spindle’; Abaza/Tapanta *dadər-ɣʷə́* ‘spindle’.

207. Proto-Indo-European **dʰuH-* (> **dʰū-*) ‘to shake, to shake off, to agitate’ (reduplicated **dʰu-dʰuH-*): Sanskrit *dhūnóti*, *dhūnuté*, *dhuváti* ‘to shake, to shake off, to remove; to agitate, to cause to tremble’ (perfect *dudhuve*; intensive *dodhūyate*, *dodhoti*, *dodhavīti*), *dhūtá-ḥ* ‘shaken’; Greek θῡ́ω, θῡ́νω ‘(of any violent motion:) to rush on or along; to storm, to rage’, θῡμός ‘spirit, courage, anger, sense’.

Northwest Caucasian: Common Abkhaz **ʒə́ʒa* ‘to shiver, to tremble’: Bzyp *a-ʒə́ʒ-ra* ‘to shiver, to tremble’; Abzhywa *a-ʒə́ʒa-ra* ‘to shiver, to tremble’.

Notes:
1. Proto-Indo-European **u* is reflected as **ə* in Northwest Caucasian.
2. Northwest Caucasian **ʒ* = Proto-Indo-European **dʰ*.

208. Proto-Indo-European **gʰeʔ-*/**gʰoʔ-* (> **gʰē-*/**gʰō-*), (extended form) **gʰeʔ-y/i-*/**gʰoʔ-y/i-* (> **gʰēy-*/**gʰōy-*; **gʰei-*/**gʰoi-*) ‘to go, to leave, to depart; to abandon, to forsake’ (**ʔ* = **ḫ₁*): Greek (Homeric) (reduplicated) κιχᾱ́νω, (Attic) κιγχάνω ‘to reach, hit, or light upon; to meet with, to find; (Homeric) to overtake, to reach, to arrive at’, χῆρα (Ionic χήρη) ‘bereft of husband, widow’, χῆρος ‘widowed, bereaved’, χώρα ‘the space in which a thing is’, χωρέω ‘to make room for another, to give way, to draw back, to retire, to withdraw; to go forward, to move on or along’, χῶρος ‘piece of ground, ground, place’, (adv.) χωρίς ‘separately, asunder, apart, by oneself or by themselves’, (dat.) χήτει ‘in lack of’, χατέω ‘to crave, to long for, to have need of, to lack’, χατίζω ‘to have need of, to crave; to lack, to be without’, χατίζων ‘a needy, poor person’; Sanskrit (reduplicated) *já-hā-ti* ‘to leave, to abandon, to desert, to quit, to forsake, to relinquish’, (causative) *hāpayati* ‘to cause to leave or abandon; to omit, to neglect; to fall short of, to be wanting’, *hāni-ḥ* ‘abandonment, relinquishment, decrease, diminution; deprivation; damage, loss, failure, ruin; insufficiency, deficit’; Latin *hērēs* ‘heir’; Gothic *gaidw* ‘lack’; Crimean Gothic *geen* ‘to go’; Swedish *gå* ‘to go’; Danish *gaa* ‘to go’; Old English *gān* ‘to go, to come, to proceed’, *gād* ‘want, lack’, *gǣsne* ‘barren, deprived of, without; wanting, scarce; dead’; Old Frisian *gān*, *gēn* ‘to go’; Old Saxon *-gān* in *ful-gān* ‘to accomplish’; Middle Dutch *gaen* ‘to go’; Old High German *gān* ‘to go’.

Northwest Caucasian:
A. Proto-Circassian **ga* ‘bad, insufficient, lacking’: Bždux *-ʒ'a* ‘bad, insufficient, lacking’; Kabardian *-ga* ‘bad, insufficient, lacking’.

B. Common Abkhaz **gə* ‘to lack something’: South Abkhaz *á-g-x̌a-ra* ‘to lose flesh (tr.), to be late (intr.); to lack something’, *a-g-rá* ‘defect, lack of something’; Abaza/Tapanta *g-x̌a-ra* ‘to lack’.
C. Ubykh *g′(a)-* ‘to lack’.

209. Proto-Indo-European **g^{h}el-/*g^{h}ol-/*g^{h}l̥-* ‘to stand, to stay; to cause to stand, to place or set upright, to fix (in place)’ (Tocharian only): Tocharian A/B *käly-* ‘to stand (intr.), to stay, to stand still; to last; to establish, to fix (in place); to invite’. Perhaps also Proto-Indo-European **g^{h}ol-g^{h}-* ‘stake, post’ (< ‘that which is set upright’) preserved in Germanic and Baltic: Proto-Germanic **ƶalǯōn* ‘the post to which a person condemned to death is bound, that is, a stake, cross (for crucifixion), or gallows’ > Gothic *galga* ‘stake, cross (for crucifixion), gallows’; Old Icelandic *galgi* ‘gallows’, *gelgja* ‘pole, stake’; Old English *gealga* ‘gallows, cross (for crucifixion)’; Old Frisian *galga* ‘gallows’; Dutch *galg* ‘gallows’; Old High German *galgo* ‘gallows, cross (for crucifixion)’ (New High German *Galgen*). Lithuanian *žalgà* ‘long, thin stake; rod’.

Northwest Caucasian: Common Abkhaz **gə́la* ‘to stand’: South Abkhaz *a-gə́la-ra* ‘to stand’; Ashkharywa *gə́la-ra* ‘to stand’; Abaza/Tapanta *gə́l-ra* ‘to stand’.

210. Proto-Indo-European **g^{h}er-/*g^{h}or-/*g^{h}r̥-* ‘to scatter, to strew’: Lithuanian *žyrù*, *žìrstu*, *žìrti* ‘to scatter, to strew’, *iššžìrti* ‘to disperse, to scatter, to spread about’. Note: Confused with words meaning ‘to glow, to sparkle, to glitter, etc.’

Northwest Caucasian: Common Abkhaz **ɣra* ‘speckled, spotted’: South Abkhaz *á-ɣra* ‘speckled, spotted’; Abaza/Tapanta *ɣra* ‘speckled, spotted’.

Note: Common Abkhaz **ɣ* (< **ɢ*) = Proto-Indo-European **g^{h}*.

211. Proto-Indo-European **g^{h}erH-/*g^{h}orH-/*g^{h}r̥H-* ‘to shake, to move to and fro’, **g^{h}r̥H-no-s* ‘shaking, moving to and fro’: Sanskrit *ghūrṇá-ḥ* ‘shaking, moving to and fro’, *ghūrṇáti*, *ghū́rṇate* ‘to move to and fro, to shake, to be agitated, to tremble, to roll about, to cause to whirl, to whirl, to turn around’.

Northwest Caucasian: (1) Common Abkhaz **gára* ‘to shake, to waddle; cradle’: Bzyp *a-gár* ‘cradle’, *á-gar-čar-ra* ‘to shake’; Abzhywa *a-gára* ‘cradle’; South Abkhaz *a-garə́-gača-ra* ‘to waddle’; Abaza/Tapanta *gára* ‘cradle’. (2) Common Abkhaz **gərə́*: South Abkhaz *á-gər-t’^{o}*, *á-gər-k’^{o}(ə)t’a* ‘epilepsy’, *a-gər-ʒá-t’^{o}* ‘sacrifice offered during prayer against migraine’ (*ʒá-t’^{o}* ‘sacrifice’), *a-gər-ʒ-nə́ħ^{o}a* ‘prayer against headache, nose bleeding, etc.’ (3) Common Abkhaz (reduplicated) **gərə-gərə́* ‘to waddle’: South Abkhaz *a-gərgər-ra* ‘to waddle’.

212. Proto-Indo-European (extended form) *g^hl-*ew*-/*g^hl-*ow*-/*g^hl-*u*- ‘(vb.) to joke, to jest, to be playful, etc.; (n.) a joke, jest, play’: Greek χλεύη ‘a joke, jest’; Old Icleandic *glý* ‘glee, gladness’, *glýja* ‘to be gleeful’, *glaðr* ‘glad, cheerful’; Old English *glīw*, *glēo*, *glēow* ‘glee, pleasure, mirth, play, sport’, *glēam* ‘revelry, joy’, *glæd* ‘cheerful, glad, joyous; pleasant, kind, gracious’, *glædnes* ‘gladness, joy’; Old Lithuanian *glaudas* ‘amusement, fun’; Russian Church Slavic *glumъ* ‘noise, amusement’; Slovenian *glúma* ‘joke, foolishness’.

Northwest Caucasian:
A. Proto-Circassian **gələ* ‘(to feel) ticklish’; Bždeux *ləʒ'ə* (< **ʒ'ələ*) ‘(to feel) ticklish’; Kabardian *gəl*, *gəl-k'əl* ‘(to feel) ticklish’.
B. Ubykh *g'ə-l-* ‘to be delighted’ (caus. *asə-g'ə́lən*).

213. Proto-Indo-European (extended form) *g^hl-*ey*-/*g^hl-*oy*-/*g^hl-*i*- ‘to glide, to slip, to slide; to be unstable, to totter’: Swedish *glinta* ‘to glide, to slip’; Old English *glīdan* ‘to glide, to slip; to glide away, to vanish’, *glidder* ‘slippery’, *gliddrian* ‘to slip, to be unstable’, *glīd* ‘slippery, ready to slide; tottering’; Old Frisian *glīda* ‘to glide’; Old Saxon *glīdan* ‘to glide’; Dutch *glijden* ‘to glide’; Old High German *glītan* ‘to glide, to slip’; Lithuanian *glitùs* ‘smooth, slippery; sticky, slimy’; Latvian *glits* ‘slippery, soggy’.

Northwest Caucasian:
A. Proto-Circassian **gal(a)* ‘to slip, to (slip and) fall’: Bždeux *ʒ'āla* ‘to slip, to (slip and) fall’; Kabardian *gāla* ‘to slip, to (slip and) fall’, *xa-gal* ‘to fall out of’.
B. (1) Common Abkhaz **g'alá* ‘to swing, to reel, to stagger; to gad about’: South Abkhaz *á-g'ala-ra* ‘to swing, to reel, to stagger; to gad about’; Ashkharywa *g'ála-ra* ‘to idle, to loaf’. (2) Common Abkhaz **g'al-dźə* ‘idle, lounger; awkward, clumsy’: Bzyp *a-g'aldźə́* ‘idle, lounger; awkward, clumsy’; South Abkhaz *á-g'aldəz-ra* ‘to idle, to loaf; to droop, to dangle (of something heavy)’. (3) Common Abkhaz (reduplicated) **g'alá-g'alá* ‘to dangle’: South Abkhaz *a-g'alg'ala-rá* ‘to dangle’.

214. Proto-Indo-European *g^{wh}el-/*g^{wh}ol-/*g^{wh}l̥- ‘to wrong, to offend, to deceive’ (only in Latin): Latin *fallō* ‘to deceive, to trick, to mislead; to be in error, to be wrong, to be mistaken’, *fallax* ‘deceitful, treacherous; misleading, deceptive; not real, false, spurious, counterfeit’, *falla* ‘a trick’, *fallācia* ‘deceit, trick, deceptive behavior’, *falsus* ‘erroneous, untrue, false, incorrect, wrong’.

Northwest Caucasian: Common Abkhaz *g^o-á-la* ‘offense, injury, discontent, resentment, anxiety’: South Abkhaz *a-g^oála* ‘offense, injury, discontent, resentment, anxiety’; Ashkharywa *g^oala-c'a-ra* ‘anxiety’; Abaza/Tapanta *g^oala* ‘dream, hope’, *g^oal-ʒ-ħa-ra* ‘anxiety’.

215. Proto-Indo-European *$g^{wh}en$-/*$g^{wh}on$-/*$g^{wh}ṇ$- ‘(vb.) to hit, to strike, to slay, to kill, to wound, to harm, to injure; (n.) strike, blow, wound’: Hittite (3rd sg. pres.) *ku-en-zi* ‘to strike, to kill’; Sanskrit *hánti* ‘to smite, to slay, to hurt, to kill, to wound’; Avestan *ǰainti* ‘to beat, to kill’; Greek θείνω ‘to strike, to wound’, φόνος ‘murder, homicide, slaughter’; Armenian *ganem* ‘to strike’; Latin *dēfendō* ‘to repel, to repulse, to ward off, to drive away; to defend, to protect’, *offendō* ‘to strike, to knock, to dash against’, *offensō* ‘to strike, to dash against’; Old Irish *gonim* ‘to wound, to slay’, *guin* ‘a wound’; Old Icelandic *gunnr* ‘war, battle’; Old English *gūþ* ‘war, battle’; Old Saxon *gūđea* ‘battle, war’; Old High German *gund-* ‘battle, war’; Old Church Slavic *gonjǫ*, *goniti* ‘to chase, to persecute’; Russian (dial.) *gonít'* [гонить] ‘to persecute’; Lithuanian *genù*, *giñti* ‘to drive’, *geniù*, *genėti* ‘to lop, to prune, to trim’.

Northwest Caucasian:
A. Common Abkhaz *$g^{o}a$ ‘to push, to shove’: South Abkhaz *á-$g^{o}a$-ra* ‘to push, to shove’; Abaza/Tapanta *á-$g^{o}a$-ra* ‘to push, to shove’.
B. Proto-Circassian *$g^{o}(a)$ ‘to pound, to husk (maize, millet, etc.)’: Bždeux *$g^{o}(a)$* ‘to pound, to husk (maize, millet, etc.)’; Kabardian *$g^{o}ə$* ‘to pound, to husk (maize, millet, etc.)’.

Note: Proto-Indo-European *$ṇ$ is reflected as **a* in Northwest Caucasian.

216. Proto-Indo-European *$g^{wh}en$-/*$g^{wh}on$-/*$g^{wh}ṇ$- ‘‘to swell, to abound; to fill, to stuff, to cram’: Sanskrit *ā-hanā́-ḥ* ‘swelling, distended’, *ghaná-ḥ* ‘compact, solid, hard, firm, dense; full of (in compounds), densely filled with (in compounds)’; Greek εὐθηνέω (Attic εὐθενέω) ‘to thrive, to prosper, to flourish, to abound’; Armenian *yogn* (< **i-* + **o-$g^{wh}on$-* or **o-$g^{wh}no$-*) ‘much’; Old Church Slavic *gonějǫ*, *goněti* ‘to suffice, to have enough’; Lithuanian *ganà* ‘enough’. Perhaps also in Germanic: Proto-Germanic *$ɣunðaz$ (< *$g^{wh}ṇ$-to-*) ‘abscess’ (< ‘that which is filled with pus’) (medical term) > Gothic *gund* ‘gangrene’; Norwegian (dial.) *gund* ‘scurf’; Old English *gund* ‘matter, pus’; Old High German *gunt* ‘pus’.

Northwest Caucasian:
A. Proto-Circassian *$g^{o}a$ ‘to fill, to stuff, to cram’: Temirgoy $g^{o}a$ ‘to fill, to stuff, to cram’. Semantic development as in Sanskrit cited above.
B. Perhaps also preserved in Common Abkhaz *$g^{o}álə$ ‘clod; goiter, wen’ (< ‘that which is swollen’): South Abkhaz *a-$g^{o}ál$* ‘clod’; Abaza/Tapanta *$g^{o}al$* ‘goiter, wen’ (medical term). Semantic development as in the Germanic forms cited above.

Note: Proto-Indo-European *$ṇ$ is reflected as **a* in Northwest Caucasian.

217. Proto-Indo-European *$g^{wh}erH$-/*$g^{wh}orH$-/*$g^{wh}ṛH$- ‘to turn around, to revolve, to roll; to move to and fro’ (only in Indo-Aryan): Sanskrit *ghūrṇáti*, *ghū́rṇate*

‘to move to and fro, to shake, to be agitated, to tremble; to roll about, to cause to whirl, to turn around’, *ghūrṇita-ḥ* ‘rolling, turning, tossing’, *ghūrṇamāna-ḥ* ‘being agitated, shaking, trembling; revolving, turning around’; Prakrit *ghulaï* ‘to turn’, *ghaṁghōra-* ‘constantly turning’, *ghummaï* ‘to turn around’.

Northwest Caucasian: Common Abkhaz (reduplicated) **gʷər-gʷə́r/lə* ‘round object’ (> ‘wheel, hoop; ring; etc.’): Abaza/Tapanta *gʷərgʷə́r* ‘ring (of chain, chain armor, etc.); small metal wheel’; South Abkhaz *a-gʷərgʷə́l* ‘wheel, hoop’, *a-gʷərgʷəl maćʷəz* ‘wedding ring’.

218. Proto-Indo-European **hepʰ-* [**hapʰ-*]/**hopʰ-* ‘to embark upon, to undertake, to start doing something’ (**h* = **ḫ₄*): Old Icelandic *efna* (< Proto-Germanic **aβnjanan*) ‘to perform, to fulfill’, *efni* ‘material, stuff’; Old English *efnan*, *æfnan* ‘to carry out, to perform, to fulfill’, *efne* ‘material’; Old High German *uoben* ‘to start to work, to practice, to worship’; Sanskrit *ápas-* ‘work, action; sacred act, sacrificial act’, *ā́pas-* ‘religious ceremony’, *ápnas-* ‘work, sacrificial act’; Latin *opus* ‘work’, *opera* ‘effort, activity’.

Notes:
1. The material from the daughter languages pointing to a Proto-Indo-European root meaning ‘wealth, riches’, though often compared with the above forms, appears to belong to a different root: **Ḫopʰ-* (**Ḫ* = a laryngeal preserved in Hittite, most likely **ḫ₃* here [cf. Hittite (adj.) *ḫappina-* ‘rich’; Latin *ops* ‘wealth, power’, *opulentus* ‘rich, wealthy; powerful, mighty’; Sanskrit *ápnas-* ‘possession, property’ (same form as given above, but with a different meaning); Avestan *afnah-vant-* ‘rich in property’]) (cf. Kloekhorst 2008b:296—297; Mayrhofer 1986—2001.I:88; De Vaan 2008:431).
2. Greek ἄφενος ‘riches, wealth, plenty’ is best explained as a borrowing.

Northwest Caucasian: Common Abkhaz **ápš'ə/a-* ‘to venture, to undertake, to start doing something; to decide, to resolve’: Abzhywa *ápš'-ga-ra* ‘to venture, to undertake, to start doing something’; Bzyp *ápš'a-ga-ra* ‘to venture, to undertake, to start doing something; to decide, to resolve’ (~ **ga* ‘to bring, to carry’).

219. Proto-Indo-European **hew-* [**haw-*] ‘to grow, to increase (in quantity or size)’ (only in extended stems: I **hew-k'(s)-* [**haw-k'(s)-*] and II **hw-ek'(s)-*) (**h* = **ḫ₄*): Sanskrit *vakṣáyati* ‘to grow, to increase, to become tall; to accumulate, to be great or strong, to be powerful’, *ójas-* ‘bodily strength, vigor, energy, ability’, *ojmán-* ‘strength’, *ukṣá-ḥ* ‘large’; Greek αὔξω (= αὐξάνω) ‘to make to grow, to increase’, (poetic) ἀ(*F*)έξω ‘to make to grow, to increase, to foster, to strengthen; to heighten, to multiply’, αὔξησις ‘growth, increase’; Latin *augeō* ‘to increase in quantity or size, to make greater, to enlarge, to extend, to swell’, *auctus* ‘an increasing, augmenting; increase, growth, abundance’, *augmentum*

'the process of increasing'; Gothic *aukan* 'to increase', *wahsjan* 'to grow'; Lithuanian *áugu*, *áugti* 'to grow, to increase', *áukštas* 'high, tall, lofty'; Tocharian A *ok-* 'to grow, to increase', B *auk-* 'to grow, to increase', *auki* 'increase', *auks-* 'to sprout, to grow up'.

Northwest Caucasian: (1) Common Abkhaz **awə́* 'to get, to obtain': South Abkhaz *aw-rá* 'to get, to obtain, to manage, to agree; to ripen (of fruit)'; Bzyp *aj-ə́w-ra* 'to get, to obtain, to manage, to agree; to ripen (of fruit)'; Abaza/Tapanta *aw-rá* 'to get, to obtain, to manage, to agree', *j-aw-ra* 'to ripen'. (2) Common Abkhaz **awə́*: South Abkhaz *aw* (indef. sg. *awə́-k'*) 'long'; Abaza/Tapanta *awə́* (indef. sg. *awə́-k'*) 'long'.

220. (1) Proto-Indo-European **hey-* [**hay-*] 'to give, to divide, to distribute' (**h* = **ḫ₄*): Hittite (3rd pres. sg.) *pa-a-i* 'to give' (< **pe-+ai-*); Tocharian A (inf.) *essi*, B (inf.) *aitsi* 'to give'; Greek (poet.) αἴνυμαι 'to take'. (2) Proto-Indo-European **hey-tʰo-* [**hay-tʰo-*], **hey-tʰi-* [**hay-tʰi-*] 'part, portion, share' (**h* = **ḫ₄*): Avestan *aēta-* 'the appropriate part'; Greek αἶσα (< **αἰτι̯α*) 'a share in a thing; one's lot, destiny; the decree, dispensation of a god'; Oscan (gen. sg.) *aeteis* 'part'.

Northwest Caucasian: Common Abkhaz **aj-g(')-ʒá* 'to share, to be stingy': Bzyp *áj-g-ʒa-ra* 'to share, to be stingy'; Abaza/Tapanta *aj-g'-ʒa-ra* 'to share, to be stingy'.

221. Proto-Indo-European **kʰeh-m-* [**kʰah-m-*] > **kʰām-* 'to wish, to desire, to long for' (**h* = **ḫ₄*): Sanskrit *kam-* (causative *kāmáyati*, *-te*) 'to wish, to desire, to long for; to love, to be in love with; to have sexual intercourse with', *kamála-ḥ* 'desirous, lustful', *kā́ma-ḥ* 'wish, desire, longing; affection, love; having a desire for, desiring'; Avestan *kāma-* 'wish, desire'; Old Persian *kāma-* 'wish, desire'; Latvian *kãmêt* 'to hunger, to be hungry'.

Northwest Caucasian: Common Abkhaz (reduplicated) **kəmə-kəmə́* 'to be greedy'; South Abkhaz *a-kəmkəm-ra* 'to be greedy'.

222. Proto-Indo-European **kʰer-*/**kʰor-*/**kʰr̥-* 'to make a rasping sound, to be hoarse; to creak, to croak': Greek κρώζω 'to cry like a crow, to caw; (of a wagon) to creak, to groan'; Latin *crōciō* 'to caw like a crow'; Old English *hrace*, *hracu* 'throat', *hrǣcan* 'to clear the throat, to spit'; Middle Low German *rake* 'throat'; Old High German *rahho* (**hrahho*) 'jaws, mouth (of beast); throat, cavity of mouth', *rāhhisōn* 'to clear one's throat'; Lithuanian *krokiù*, *krõkti* 'to grunt'.

Northwest Caucasian: Common Abkhaz (reduplicated) **qər-qər* 'snore, snoring': Bzyp *á-x̌ərx̌ər-ħa* 'snore, snoring'.

223. Proto-Indo-European *k^hṃH- ‘to work, to toil, to labor’: Sanskrit *śā́myati* ‘to toil at, to exert oneself; to grow calm, to pacify’ (originally ‘to be tired’), (participle) *śān-tá-ḥ* ‘calmed, pacified, stilled’; Greek κάμνω ‘to work, to labor, to toil, to be weary’.

Northwest Caucasian: Common Abkhaz **kamsá* ‘to work as a (farm-)laborer; to dance (awkwardly, clumsily)’: South Abkhaz *a-kamsa-rá* ‘to work as a (farm-)laborer; to dance (awkwardly, clumsily)’.

224. Proto-Indo-European **k’el-*/**k’ol-*/**k’l-* ‘to cleave, to split’ (extended form: **k’l-ew-b^h-*/**k’l-ow-b^h-*/**k’l-u-b^h-* ‘to cleave, to split’): Proto-Germanic **kleuβanan* ‘to cleave, to split’ > Old Icelandic *kliúfa* ‘to cleave, to split’; Old English *clēofan* ‘to cleave, to split’; Old High German *klioban* ‘to cleave, to split’. Proto-Germanic **kluβōn* ‘cleft, rift’ > Old Icelandic *klofi* ‘cleft, rift’; Old Frisian *klova* ‘chasm’; Old High German *klobo* ‘snare, trap’. Greek γλύφω ‘to carve, to cut out with a knife; to engrave’; Latin *glūbō* ‘to remove bark from a tree, to peel away bark’.

Northwest Caucasian: Common Abkhaz **k’alə* ‘to cleave, to split’: Abzhywa *a-k’ál-ra* ‘to cleave, to split squared timber for making shingle’.

225. Proto-Indo-European **k’el-*/**k’ol-*/**k’l-* ‘to soften, to weaken; to be or become soft, weak’: Old Icelandic *klökkr* ‘bending, pliable, soft’, *klökkva* ‘to soften’; Low German *klinker* ‘weak’; Lithuanian *glẽžnas* ‘delicate, flabby, sickly, puny, frail, weak, feeble’, *glęžtù*, *gležiaũ*, *glèžti* ‘to become weak, flabby’.

Northwest Caucasian: Common Abkhaz **k’alá* ‘slender, elegant, graceful’: South Abkhaz *a-k’alá* ‘slender, elegant, graceful’.

226. Proto-Indo-European (extended form) **k’em-b^h-*/**k’om-b^h-*/**k’ṃ-b^h-* ‘to chew (up), to bite, to crush’, **k’om-b^ho-s* ‘tooth, spike, nail’: Greek γόμφος ‘bolt, pin’, γομφίος ‘a grinder-tooth’; Sanskrit *jámbhate*, *jábhate* ‘to chew up, to crush, to destroy’, *jámbha-ḥ* ‘tooth’, *jámbhya-ḥ* ‘incisor, grinder’; Albanian *dhëmb* ‘tooth’; Old Icelandic *kambr* ‘comb’; Old English *camb* ‘comb’, *cemban* ‘to comb’; Old Saxon *kamb* ‘comb’; Old High German *kamb*, *champ* ‘comb’; Lithuanian *žam̃bas* ‘pointed object’; Old Church Slavic *zǫbъ* ‘tooth’; Russian *zub* [зуб] ‘tooth’; Tocharian A *kam*, B *keme* ‘tooth’.

Northwest Caucasian: Common Abkhaz (reduplicated) **q’əm-q’əmə* ‘(to eat) greedily, being very hungry’: Bzyp *q’əm-q’ə́m-wa* ‘(to eat) greedily, being very hungry’.

227. Proto-Indo-European (**k’en-*/**k’on-*/)**k’n-* ‘to bend, twist, turn, or tie together’: Greek γνάμπτω ‘to bend’, γναμπτός ‘bent, curved’; Old Icelandic *kneikja* ‘to bend backwards with force’, *knytja* ‘to knit or tie together’, *knýta*

‘to knit, to fasten by a knot, to bind, to tie’; Swedish *kneka* ‘to be bent’; Old English *cnyttan* ‘to tie with a knot’, *cnyttels* ‘string, sinew’; Middle Low German *knutten* ‘to tie’; New High German *knicken* ‘to crease, to bend, to fold, to crack, to break, to split, to snap, to burst’, *knütten* (dial.) ‘to knit’.

Northwest Caucasian: Common Abkhaz **k''ant'/dá* ‘to swing, to rock, to bend’: South Abkhaz *a-k''ant'a-rá*/*á-k''anda-ra* ‘to swing, to rock, to bend’; Abaza/Tapanta *k''ant'a* ‘elastic, resilient’, *k''ant'a-ra* ‘to bend’.

228. Proto-Indo-European **k'er(H)-*/**k'or(H)-*/**k'r̥(H)-* ‘to decay, to wear out, to wither, to waste away, to become old’: Sanskrit *járati* ‘to grow old, to become decrepit, to decay, to wear out, to wither, to be consumed, to break up, to perish’, *jára-ḥ* ‘becoming old, wearing out, wasting’, *jaraṇá-ḥ* ‘old, decayed’, *jīrṇá-ḥ* ‘old, worn out, withered, wasted, decayed’, *jūrṇá-ḥ* ‘decayed, old’, *járat-* ‘old, ancient, infirm, decayed, dry (as herbs), no longer frequented (as temples) or in use’, *jarā́* ‘old age’; Armenian *cer* ‘old’; Greek γεραιός ‘old’, γέρων ‘(n.) an old man; (adj.) old’, γῆρας ‘old age’; Old Icelandic *karl* ‘man, old man’; Old English *carl* ‘man’ (Norse loan), *ceorl* ‘free man of the lowest class; free man; common man; husband; man, hero’; Old High German *karl* ‘man, husband’; Old Church Slavic *zrěti* ‘to ripen, to mature’, *zrělъ* ‘ripe’.

Northwest Caucasian: Common Abkhaz **q'arḥºážə*/**q'ərḥºážə* ‘very old, decrepit’: South Abkhaz *a-q'arjºáž*/*a-q'ərjºáž* ‘very old, decrepit’.

229. Proto-Indo-European **k^{w}h$_{1}$at^{h}-* ‘to move vigorously to and fro, to shake, to rock, to agitate’ (Latin only): Latin *quatiō* ‘to move vigorously to and fro, to shake, to rock, to agitate’, *quassus* ‘shaking’. Note: Not related to Greek πάσσω (< *πάσ-τι̯-ω) (Attic πάττω) ‘to strew, to sprinkle’, πάσμα ‘sprinkling; (medic.) powder’, παστέος ‘to be besprinkled’, παστός ‘sprinkled with salt, salted’.

Northwest Caucasian: Common Abkhaz **kºaćá* ‘to stir, to move (aside)’: Bzyp *a-kºaća-ra* ‘to stir, to move (aside)’; Abzhywa *a-kºaća-rá* ‘to stir, to move (aside)’.

Note: Common Abkhaz **ć* = Proto-Indo-European **t^{h}*.

230. Proto-Indo-European **k'^{w}eh-* [**k'^{w}ah-*] (> **k'^{w}ā-*) ‘to walk, to go’ (**h* = **ə$_{4}$*): Sanskrit (redup.) *jí-gā-ti*, (aor.) *á-gā-t* ‘to go’; Avestan (aor.) *gāṯ* ‘to walk, to go’; Armenian *kam* (< **k'^{w}eh-mi* [**k'^{w}ah-mi*] > **k'^{w}ā-mi*) ‘to stay, to stand, to halt; to stop, to rest; to wait; to appear; to dwell’; Greek (redup. 3rd sg. pres.) *βί-βᾱ-τι ‘to go’, (Attic) (1st sg.) βίβημι ‘to go’, (Homeric) (ptc.) βιβᾱ́ς ‘walking’, (Laconian) (3rd pl.) βίβαντι ‘to go’; Lithuanian (dial.) *góti* ‘to rush, to hurry’; Latvian (1st sg. pret.) *gāju* ‘to go’.

Northwest Caucasian (cf. Chirikba 1996a:207 and 403: Common Northwest Caucasian *$k'^{o\prime}a$- ‘to walk, to go’):

A. Common Abkhaz *$k'^{o}a$- in *$k'^{o}a$-$ša$ ‘to dance’ (*$ša$ = ‘to wind, to twine’): South Abkhaz *á-k'ᵒaša-ra* ‘(to) dance’; Abaza/Tapanta *k'ᵒaša-rá* ‘(to) dance’.
B. Common Circassian *$k'^{o}a/ə$ ‘to go, to cover a distance (tr./intr.)’: Bždedux *k'ᵒ(a)* ‘to go, to cover a distance (tr./intr.)’; Kabardian *k'ᵒ(a)* ‘to go, to cover a distance (tr./intr.)’. Note: Kuipers (1975:60, §85) reconstructs Proto-Circassian *$k'^{o}(a)$ ‘to go, to cover a distance (tr./intr.)’.
C. Ubykh *k''a*- ‘to go, to leave’ (*š'əɣak''án* ‘let’s go’).

231. Proto-Indo-European *$k'^{w}ed^{h}$-/*$k'^{w}od^{h}$- ‘to strike, to beat, to smash’: Middle High German *quetzen*, *quetschen* ‘to bruise, to mash, to crush’; Middle Low German *quetsen*, *quessen*, *quetten* ‘to crush, to squeeze’; Dutch *kwetsen* ‘to injure, to wound’; Swedish *kvadda* ‘to smash to pieces’.

Northwest Caucasian: Proto-Circassian *$k'^{o}ad(a)$ ‘to disappear, to get lost, to perish’: Bždedux *k'ᵒadə* ‘to disappear, to get lost, to perish’; Kabardian *k'ᵒad* ‘to disappear, to get lost, to perish’.

232. Proto-Indo-European *$k'^{w}ehb^{h}$- [*$k'^{w}ahb^{h}$-]/*$k'^{w}ohb^{h}$- (> *$k'^{w}āb^{h}$-/*$k'^{w}ōb^{h}$-) ‘to dip (in water), to submerge’ (*h = *$ḫ_4$): Greek βάπτω ‘to dip in water; to dye’, βαφή ‘dipping of red-hot iron into water; to dip in dye’; Old Icelandic *kefja* ‘to dip, to put under water’, *kvefja* ‘to submerge, to swamp’, *kvæfa*, *kœfa* ‘to quench, to choke, to drown’, *kvafna* ‘to be suffocated, choked (in water, stream)’; Middle High German *er-queben* ‘to suffocate’.

Northwest Caucasian:

A. Common Abkhaz *$k'^{o}abá$ ‘to wash, to bathe’: South Abkhaz *á-k'ᵒaba-ra* ‘to wash, to bathe’; Abaza/Tapanta *k'ᵒaba-rá* ‘to wash, to bathe’.
B. Ubykh *k'ᵒaba*- ‘to wash, to bathe’.

233. Proto-Indo-European (extended form) *$k'^{w}e\underset{\smile}{ḫḫ}$-$d^{h}$- [*$k'^{w}a\underset{\smile}{ḫḫ}$-$d^{h}$-]/*$k'^{w}o\underset{\smile}{ḫḫ}$-$d^{h}$- (> *$k'^{w}ād^{h}$-/*$k'^{w}ōd^{h}$-) ‘to push or press in, to tread (under foot)’ (*$\underset{\smile}{ḫḫ}$ = *$ḫ_2$): Sanskrit *gā́hate* ‘to dive into, to bathe in, to plunge into; to penetrate, to enter deeply into’, *gāḍha-ḥ* ‘pressed together, close, fast, strong, thick, firm’; Prakrit *gāhadi* ‘to dive into, to seek’; Sindhi *gāhaṇu* ‘to tread out grain’; Punjabi *gāhṇā* ‘to tread out, to tread under foot, to travel about’; Hindi *gāhnā* ‘to tread out, to caulk’; Serbo-Croatian *gàziti* ‘to wade, to tread’, *gaz* ‘ford’.

Northwest Caucasian: Common Abkhaz *$k'^{o}aħa$ ‘to knead (dough, clay, mud, etc.); to trample, to stamp’: South Abkhaz *á-k'ᵒaħa-ra*, *a-k'ᵒaħa-rá* ‘to knead (dough, clay, mud, etc.); to trample, to stamp’; Abaza/Tapanta *k'ᵒħa-ra* ‘to knead (dough, clay, mud, etc.); to trample, to stamp’.

234. Proto-Indo-European **k'ʷes-* 'to extinguish': Lithuanian *gestù*, *gèsti* 'to go out, to die out, to become dim'; Old Church Slavic *u-gasiti* 'to put out'.

Northwest Caucasian:

A. Proto-Circassian **k'ºasa* 'to go out (as fire, light); to escape, to run away, to desert, to elope': Bždedux *k'ºāsa* 'to go out (as fire, light)'; Kabardian *k'ºāsa* 'to escape, to run away, to desert, to elope'.
B. Common Abkhaz **k'ºášə* 'to harden, to be petrified (of wood); to be reduced to ashes; to be annihilated': South Abkhaz *a-k'ºáš mca* 'fire (*mca*) made of hardened wood', *a-k'ºáš-x̌a-ra* 'to harden, to be petrified (of wood); to be reduced to ashes; to be annihilated'.

235. Proto-Indo-European **leh̯h-* [**lah̯h-*] (extended form **leh̯h-w/u-* [**lah̯h-w/u-*]) 'to pour, to pour out (liquids)' (**h̯h* = **ə₂*): Hittite *laḫ-* in: (nom. sg.) *la-aḫ-ni-iš* 'flask, flagon, frequently of metal (silver, gold, copper)' (acc. pl. *la-ḫa-an-ni-uš*), (1st sg. pret.) *la-a-ḫu-un* 'to pour, to pour out (liquids)', (2nd sg. imptv.) *la-a-aḫ* 'pour!'; *laḫ(ḫ)u-* in: (3rd sg. pres.) *la(-a)-ḫu(-u)-wa(-a)i*, *la-ḫu-uz-zi*, *la-a-ḫu-u-wa-a-iz[-zi]* 'to pour (liquids, fluids; containers of these); to cast (objects from metal); to flow fast, to stream, to flood (intr.)', (reduplicated ptc.) *la-al-ḫu-u-wa-an-ti-it* 'poured', (reduplicated 3rd sg. pres.) *li-la-ḫu-i*, *le-el-ḫu-wa-i*, *li-il-ḫu-wa-i* 'to pour', (reduplicated acc. sg.) *le-el-ḫu-u-un-da-in* 'a vessel'; Luwian (1st sg. pret.) *la-ḫu-ni-i-ḫa* 'to pour' (?); Greek ληνός (Doric λᾱνός) 'anything shaped like a tub or a trough: a wine-vat, a trough (for watering cattle), a watering place' (< **lā-no-s* < **leh̯h-no-s* [**lah̯h-no-s*]).

Northwest Caucasian: Proto-Circassian **λaħa* 'rivulet': Šapsegh *λaħa* 'rivulet'.

236. Proto-Indo-European **leh̯hʷ-* [**lah̯hʷ-*] (> **lāw-*), (**ləh̯hʷ-* >) **luh̯hʷ-* (> **lū-*) 'to hit, to strike, to beat' (**h̯hʷ* = **ə₂ʷ*): Sanskrit *lū-* (3rd sg. pres. act. *lunā́ti*, [Vedic] *lunoti*) 'to cut, to sever, to divide, to pluck, to reap, to gather; to cut off, to destroy, to annihilate', *láva-ḥ* 'act of cutting, reaping (of grain), mowing, plucking, or gathering', *lāva-ḥ* 'cutting, cutting off, plucking, reaping, gathering; cutting to pieces, destroying, killing', *laví-ḥ* 'cutting, sharp, edge (as a tool or instrument); an iron instrument for cutting or clearing', *lūna-ḥ* 'cut, cut off, severed, lopped, clipped, reaped, plucked; nibbled off, knocked out; stung; pierced, wounded; destroyed, annihilated', *lūnaka-ḥ* 'a cut, wound, anything cut or broken; sort, species, difference', *lavítra-m* 'sickle'; Old Icelandic *ljósta* (< **lew-s-*) 'to strike, to smite; to strike, to hit (with a spear or arrow)', *ljóstr* 'salmon spear', *lost* 'blow, stroke', *lýja* 'to beat, to hammer; to forge iron; to wear out, to exhaust; (reflexive) to be worn, exhausted', *lúi* 'weariness', *lúinn* 'worn, bruised; worn out, exhausted'; Norwegian (dial.) *lua* 'to unwind'; Old Irish *loss* 'the point or end of anything, tail'; Welsh *llost* 'spear, lance, javelin, tail' (< **lustā*).

Northwest Caucasian: Common Abkhaz **laħʷá* ‘to pound, to thresh; mortar’: Abaza/Tapanta *laħʷa-rá* ‘to pound, to husk (grains)’, *č'-laħʷa-ra* ‘mortar for threshing grains’ (**č'a* ‘wheat’) ; South Abkhaz *a-laħʷa-rá* ‘to thresh (grains)’; Bzyp *a-laħʷ(a)rə́* ‘mortar for threshing grains’; Abzhywa *a-laħʷa-rá* ‘mortar for threshing grains’.

237. Proto-Indo-European **mas-* ‘to entice, to lure, to instigate; to allure, tempt, or induce someone to do something wrong, bad, or evil’; Lithuanian *mãsinti* ‘to incite; to instigate, to stir up; to lure, to seduce, to attract, to entice’, *masẽnis* ‘enticement, temptation; tempter, seducer’; Norwegian *mas* ‘bother, trouble, difficulty, fuss; fretting, importunity’, *mase* ‘to struggle, to toil, to slave away; to fret, to fuss, to nag, to harp’, *maset(e)* ‘fussy; harping, nagging; taxing, toilsome’.

Northwest Caucasian: Proto-Circassian **məs(a)* ‘guilty, dishonest; culprit’: Bždeduх *məsa* ‘guilty, culprit’; Kabardian *məsa* ‘guilty, culprit; dishonest, uneducable’; Temirgoy *məsa* ‘guilty, culprit; foreign’, *wə-məsa*, *wə-məs* ‘to unmask, to catch in a lie, to prove wrong’ (tr.).

238. Proto-Indo-European **mat'-* ‘to be wet, moist’: Greek μαδάω ‘to be moist’; Latin *madeō* ‘to be wet’; Sanskrit *máda-ḥ* ‘any exhilarating or intoxicating drink; hilarity, rapture, excitement, inspiration, intoxication; ardent passion for, sexual desire or enjoyment, wantonness, lust, ruttishness, rut (especially of an elephant); pride, arrogance, presumption, conceit of or about; semen’, *mádati* ‘to be glad, to rejoice, to get drunk’, *mádya-ḥ* ‘(adj.) intoxicating, exhilarating, gladdening, lovely; (n.) any intoxicating drink, vinous or spiritous liquor, wine, Soma’; Avestan *mada-* ‘intoxicating drink’.

Northwest Caucasian: Common Abkhaz **mat'ə́jə* ‘drizzle’: Bzyp *á-mat'əj* ‘drizzle; nectar’, *mat'ə́jk'a* ‘melted wax’ (metaphorically, ‘state of a man under the influence of the evil eye’).

239. Proto-Indo-European **neg^{h}-*/**nog^{h}-* ‘to strike, to split, to pierce’: Old Irish *ness* ‘wound’; Old Church Slavic *nožь* ‘knife’, *pro-noziti* ‘to pierce through’.

Northwest Caucasian: Proto-Circassian **nag(a)* ‘misshapen; to disfigure’: Kabardian *naga-ʔʷəga* ‘misshapen’, *bzaga-nāga* ‘bad, nasty, evil’, *wə-nag* ‘to disfigure’; Temirgoy *naǯ'a-ʔʷəʒ'a* ‘misshapen’.

240. Proto-Indo-European **p^{h}at^{h}-* ‘to beat, to knock; to strike, to smite’ (only in Greek): Greek πατάσσω ‘to beat, to knock; to strike, to smite’, παταγμός ‘a beating’, etc.

Northwest Caucasian: Proto-Circassian **p^{h}at^{h}a* ‘to damage, to wear out (a surface)’: Bždeduх *ğa-p^{h}at^{h}a-n* ‘to damage, to wear out (a surface)’.

241. Proto-Indo-European *$p^he\underset{\smile}{ħh}$- [*$p^ha\underset{\smile}{ħh}$-]/*$p^ho\underset{\smile}{ħh}$- > *$p^hā$-/*$p^hō$- ‘to protect, to guard, to defend’ (*$\underset{\smile}{ħh}$ = *$ḫ_2$): Hittite (1st pres. sg. act.) *pa-aḫ-ḫa-aš-ḫi*, *pa-aḫ-ḫa-aš-mi* ‘to protect, to guard, to defend; to observe (agreements), to keep (oaths), to obey (commands), to keep (a secret)’; Tocharian B *pāsk-* ‘to guard, to protect; to practice (moral behavior)’.

Northwest Caucasian: Common Abkhaz *$px̌a$ ‘authority’: Abaza/Tapanta *$px̌a$* ‘authority, respect, honor’. Common Abkhaz *$px̌ə́$-$k^oə$ (< *$px̌a$ ‘authority’, *$k^oə$ ‘vow’) ‘duty, obligation; fate’: South Abkhaz *a-$px̌ə́$-k^o* ‘duty, obligation; fate’.

Note: Proto-Indo-European *$p^hV\underset{\smile}{ħh}$- = Common Abkhaz *$px̌V$*.

242. Proto-Indo-European *p^her-/*p^hor-/*$p^hr̥$- ‘(vb.) to fly, to flee; (n.) feather, wing’: Hittite (3rd sg.) *pár-aš-zi* ‘to flee’; Sanskrit *parṇá-m* ‘wing, feather’; Latin *-perus* in *properus* ‘quick, rapid, hasty’, *properō* ‘to hasten’; Russian Church Slavic *perǫ*, *pъrati* ‘to fly’, *pero* ‘feather’.

Northwest Caucasian:
A. Common Abkhaz *$pərə́$* ‘to fly’: South Abkhaz *a-pər-rá* ‘to fly’, *á-pər-pər-ra* ‘to flit, to flutter, to flap’; Ashkharywa: (Kuv) *pər-rá*, (Apsua) *bər-rá* ‘to fly’; Bzyp *jə-pərpər-wá* ‘doing something quickly’, *á-pər-ħa* ‘quickly, swiftly’.
B. Ubykh *pər-* ‘to fly’.

243. Proto-Indo-European *p^het^h-/*p^hot^h- ‘to fly, to rush, to pursue; to fall, to fall down’: Hittite *pát-tar* ‘wing’, (3rd pl. pres.) *pít-ti-(ya-)an-zi* ‘to flee, to fly, to hasten’; Sanskrit *pátati* ‘to fly, to soar, to rush on; to fall down or off; to set in motion, to set out on foot; to rush on, to hasten’, (causative) *patáyati* ‘to fly or move rapidly along, to speed’, *pátram* ‘wing, feather’, *pátvan-* ‘flying, flight’; Greek πέτομαι ‘to fly; (also of any quick motion) to fly along, to dart, to rush; to be on the wing, to flutter’, πίπτω ‘to fall, to fall down’, πτερόν ‘feather, bird’s wing’; Latin *petō* ‘to make for, to go to, to seek’; Old Irish *én* (< *ethn- < *pet-no-s*) ‘bird’; Welsh *edn* ‘bird’; Old Breton *etn-* ‘bird’; Old Icelandic *fjöðr* ‘feather, quill’; Old English *feþer* ‘feather’, (pl.) *feþra* ‘wings’; Old Frisian *fethere* ‘feather’; Old Saxon *fethara* ‘feather’; Old High German *fedara* ‘feather’, *fettāh* ‘wing’.

Northwest Caucasian: Common Abkhaz (reduplicated) *pat-$pátə$ ‘to flutter, to quiver (of bird); to flounder, to wallow’: South Abkhaz *a-pat-pát-ra* ‘to flutter, to quiver (of bird); to flounder, to wallow’; Bzyp *a-pat-mát-ra* ‘to flutter, to quiver (of bird); to flounder, to wallow’.

244. Proto-Indo-European *p^het^h-/*p^hot^h- ‘to twist together, to weave together’: Hittite (nom.-acc. sg.) *pa-at-tar*, *pát-tar* ‘basket (made of wicker or reed)’. Perhaps also: Proto-Germanic *$faθō$ (‘wickerwork’ >) ‘hedge, fence’ > Gothic

faþa ‘hedge, fence, dividing wall’; Middle High German *vade*, *vate* ‘hedge, fence’. And, in the meaning ‘thread’: Old High German *fadam*, *fadum* ‘thread, yarn’ (New High German *Faden* ‘thread’), *fadamōn* ‘to spin, to sew’; Old Welsh *etem* ‘thread, yarn’. Note: The Germanic and Celtic forms are usually derived from Proto-Indo-European *p^het^h-/*p^hot^h- ‘to be wide, open, spacious, spread out; to stretch, to extend, to spread out’.

Northwest Caucasian: Common Abkhaz *patá ‘to get tangled, to become enmeshed (of thread)’; South Abkhaz *áj-la-pata-ra* ‘to get tangled, to become enmeshed (of thread)’.

245. Proto-Indo-European *p^het^h-/*p^hot^h- ‘to be wide, open, spacious, spread out; to stretch, to extend, to spread out’: Avestan *paθana-* ‘wide, broad’; Greek πετάννῡμι ‘to spread out’, πέταλος ‘broad, flat’, πέτασμα ‘anything spread out’, πέτηλος ‘outspread, stretched’, ἀναπετής ‘expanded, spread out, wide open’; Latin *pateō* ‘to be open’, *patulus* ‘extending over a wide space, wide-open, broad’; Old Welsh *etem* ‘fathom’; Old Icelandic *faðmr* ‘outstretched arms, embrace; fathom’, *faðma* ‘to embrace’; Old English *fæþm* ‘outstretched arms, embrace; cubit, fathom’; Old Saxon (pl.) *fathmos* ‘outstretched arms, embrace’; Old High German *fadam*, *fadum* ‘cubit’ (New High German *Faden*).

Northwest Caucasian *pə́tə ‘a bit, a small portion, a little’: South Abkhaz *pət-k’*, *a-pə́t* ‘a bit, a small portion, a little’, *pət-r-áamta* ‘for some time’, *pət-jºə́-k’* ‘several, some people’. For the semantics, cf. Latin *tenuis* in the sense ‘present in a very small quantity, scanty, meager (of material and non-material things)’ (*Oxford Latin Dictionary* [1968], p. 1922) < Proto-Indo-European *t^hen-/*t^hon-/*$t^hn̥$- ‘to extend, to spread, to stretch’.

246. Proto-Indo-European *p^hol- ‘to fall, to fall down’: Armenian *p^hlanim* ‘to fall in’; Old Icelandic *falla* ‘to fall’, *fall* ‘fall, death, ruin, decay, destruction’, *fella* ‘to fell, to make to fall, to kill, to slay’; Old English *feallan* ‘to fall, to fall down, to fail, to decay, to die; to prostrate oneself’, *feall*, *fiell* ‘fall, ruin, destruction, death’, *fiellan* ‘to make to fall, to fell, to pull down, to destroy, to kill; to humble’; Old Saxon *fallan* ‘to fall’, *fellian* ‘to fell’; Old High German *fallan* ‘to fall’ (New High German *fallen*), *fellan* ‘to fell’ (New High German *fällen*); Lithuanian *púolu*, *pùlti* ‘to fall (up)on, to attack, to assault, to fall’.

Northwest Caucasian: Common Abkhaz *palá ‘ snowflake’: South Abkhaz *a-pál* ‘snowflake’, (reduplicated) *palá-palá* (adv.) ‘falling by flakes (of snow)’.

247. Proto-Indo-European (reduplicated) *p^hor-p^hor- ‘to move, wave, or sway in a flapping manner’ (only in Slavic): Old Church Slavic *porporъ* ‘flag’; Czech *praper* ‘flag’; Polish *proporzec* ‘streamer, small flag’. Derivative of Proto-Indo-European *p^her-/*p^hor-/*$p^hr̥$- ‘(vb.) to fly, to flee; (n.) feather, wing’.

Northwest Caucasian: Common Abkhaz (reduplicated) **par-párə* ‘to flap (wings); to twitch (for example, of eyes)’: South Abkhaz *a-par-par-rá* ‘to flap (wings); to twitch (for example, of eyes)’.

248. Proto-Indo-European **(s)tʰeh-* [**(s)tʰah-*] (> **(s)tʰā-*) ‘to stand’ (**h* = **ə₂*): Sanskrit (reduplicated) *tíṣṭhati* ‘to stand’; Greek (reduplicated) ἵστημι (Doric ἵστᾱμι) ‘to stand’; Latin (reduplicated) *sistō* ‘to cause to stand, to put, to place’, *status* ‘standing, standing position’; Luwian *tā-* ‘to step, to arrive’. Note also: Hittite *ištantāye/a-* ‘to stay put, to linger, to be late’; Gothic *standan* ‘to stand’; Old Icelandic *standa* ‘to stand’; Old English *standan* ‘to stand’; Old Saxon *standan* ‘to stand’; Old High German *stantan* ‘to stand’.

Northwest Caucasian:

A. Proto-Circassian **tʰə* ‘to stand’: Bždedux *tʰə* ‘to stand’; Kabardian *tə* ‘to stand’ (only with local prefixes).
B. Common Abkhaz **ta* ‘stand, place of, home’: South Abkhaz *a-tá-zaa-ra*, *a-ta-rá* ‘to be inside’, *a-t-rá* ‘place of something’, *ta-* (preverb) ‘inside’; Abaza/Tapanta *tá-z-la-ra* ‘to be inside’, *ta-rá* ‘place of something’, *ta-* (preverb) ‘inside’, *ta* ‘stand, place of, home’.

249. Proto-Indo-European **tʰekʰ-*/**tʰokʰ-* ‘to seek, to ask for’ (only in Germanic): Old Icelandic *þiggja* ‘to receive, to accept’; Danish *tigge* ‘to beg’; Swedish *tigga* ‘to beg, to beg for’; Norwegian *tigge* ‘to beg (*om* for), to beseech, to implore; to solicit’; Old English *þicgan* ‘to take, to receive, to accept’; Old Saxon *thiggian* ‘to ask, to request; to endure’; Old High German *dicken*, *digen* ‘to beg for, to request’. Note: Old Irish and Lithuanian cognates have been proposed, but these are questionable and, therefore, are not included here.

Northwest Caucasian: Common Abkhaz **taqə́* ‘to wish, to desire’: Abzhywa *a-taxˇ-rá* ‘(to) wish, (to) desire’; Abaza/Tapanta *taqə́-ra* ‘(to) wish, (to) desire’; Bzyp *a-taχ̲ˇ-rá* ‘(to) wish, (to) desire’.

250. Proto-Indo-European **tʰekʷʰ-* (with nasal infix: **tʰe-n-kʷʰ-*) ‘to stretch out, to reach out’ > ‘to reach, to arrive at, to come up to, etc.’ (Baltic only): Lithuanian *tenkù*, *tekaũ*, *tèkti* ‘to come up to, to approach, to reach; to fall to one’s lot; to be allotted, apportioned; to come into one’s possession; to have enough; to extend out, to stretch out, to reach out’; Latvian *tikt* ‘to become, to attain, to arrive (at), to reach’. For the semantics, cf. Buck 1949:§9.55 arrive (intr.) and arrive at, reach (trans.).

Notes:

1. Probably not related to the following Germanic forms: Old Icelandic *þiggja* ‘to receive, to accept’; Danish *tigge* ‘to beg’; Swedish *tigga* ‘to beg, to beg for’; Norwegian *tigge* ‘to beg (*om* for), to beseech, to implore; to solicit’; Old English *þicgan* ‘to take, to receive, to accept’; Old Saxon

thiggian ‘to ask, to request; to endure’; Old High German *dicken*, *digen* ‘to beg for, to request’.

2. Also probably not related to Old Irish *ad-teich* ‘to find refuge with someone, to entreat, to pray to’, which Matasović (2009:26) convincingly derives from Proto-Celtic **ad-tek^{w}-o-* ‘to run to, to approach’, itself a derivative of Proto-Celtic **tek^{w}-o-* ‘to run, to flee’ (cf. Matasović 2009: 377). Strong support for Matasović’s position is provided by the Middle Welsh cognate (1st sg.) *athechaf* ‘to flee from, to avoid’, which Matasović (2009:26) derives from Proto-Celtic **ab-tek^{w}-o-* instead of the Proto-Celtic **ad-tek^{w}-o-* needed to explain the Old Irish form.
3. Hittite (3rd sg. pres. act.) *te-ek-ku-uš-ši-[ez-zi]* ‘to show, to present (oneself)’, (2nd sg. pres. act.) *te-ek-ku-uš-ša-nu-ši* ‘to (make) show, to reveal, to (make) present someone’, (3rd sg. pres. act.) *te-ek-ku-uš-še-eš-ta* ‘to become visible’, etc. are usually compared with Avestan *daxš-* ‘to teach’, *daxšta-* ‘sign’ (cf, Kloekhorst 2008:864—865). However, it seems more likely that the Hittite forms are derivatives of Proto-Indo-European **t^{h}ek^{wh}-* ‘to stretch out, to reach out’ (> **t^{h}ek^{wh}-s-ye/o-* ‘to point out, to show, to reveal; to be revealed, to become visible, etc.’) and that they are to be compared with the Baltic forms cited above rather than with Avestan *daxš-* ‘to teach’, *daxšta-* ‘sign’.

Northwest Caucasian: Proto-Circassian **t^{h}aq:^{o}(a)* ‘to strew, to pour out’: Temirgoy *tāq^{o}(a)* ‘to strew, to pour dry substances’, *ğa-taq^{o}a-n* ‘to pour out of (a container)’; Kabardian *tāq’^{o}a* ‘to strew, to pour dry substances’ (with local prefixes, *yə-*, *xa-* ‘into’). For the semantics, cf. Buck 1949:§9.34 spread out; strew.

251. Proto-Indo-European **t^{h}el-k^{h}-/*t^{h}ol-k^{h}-/*t^{h}l̥-k^{h}-* ‘to push, to thrust, to knock, to strike’: Welsh *talch* ‘fragment, flake’; Old Irish *tolc*, *tulc* ‘blow, strike’; Old Church Slavic *tlъkǫ*, *tlěšti* ‘to knock’; Russian *tolkat'* [толкать] ‘to push, to shove’, *tolkač* [толкач] ‘stamp; pusher’; Czech *tlak* ‘pressure’.

Northwest Caucasian: Proto-Circassian **t:aλa* ‘to splash, to threaten; to shake (fist), to wave threateningly; to rattle (the saber)’: Temirgoy *tāλa* ‘to splash, to threaten’, *ğa-taλa-n* ‘to shake (fist), to wave threateningly; to rattle (the saber)’; Kabardian *dāλa* ‘to splash, to threaten’, *ğa-dāλa* ‘to shake (fist), to wave threateningly; to rattle (the saber)’.

252. Proto-Indo-European **t^{h}er-s-*, **t^{h}r-es-* ‘to tremble, to shake’: Sanskrit *trásati* ‘to tremble, to quiver’; Avestan *tərəs-* ‘to be afraid’; Greek τρέω ‘to tremble, to quiver’; Latin *terreō* ‘to frighten, to terrify’, *terror* ‘fright, fear, terror, alarm, dread’. Note also Proto-Indo-European **t^{h}r-em-/*t^{h}r-om-/*t^{h}r-m̥-* ‘to tremble, to shake’: Greek τρέμω ‘to tremble, to quiver’, τρόμος ‘a trembling, quaking, quivering (especially with fear)’; Latin *tremō* ‘to tremble, to quake’; Old

Church Slavic *tręsǫ*, *tręsti* ‘to shake’; Tocharian A *träm-* ‘to be furious’, B *tremi* ‘anger’.

Northwest Caucasian: Common Abkhaz **tráśə* ‘to startle’: Bzyp *á-traś-ra* ‘to startle’, Abzhywa *a-trás-ra* ‘to startle’; Abaza/Tapanta *trás-ra* ‘to rush, to throw oneself towards something; to attack’.

253. Proto-Indo-European **t’eA^{w}-* [**t’aA^{w}-*] (> **t’āw-*) ‘to burn, to blaze’: Sanskrit *dāvá-ḥ* ‘forest fire’, *dāváyati* ‘to burn, to consume by fire’; Greek δαίω (< *δαϝ-ι̯ω) ‘to light up, to make to burn, to kindle; to blaze, to burn fiercely’, δαΐς ‘firebrand, pine-torch’, (Homeric) δάος ‘torch’.

Northwest Caucasian: Common Abkhaz **t’əĥ^{o}a* ‘monster swallowing sun or moon (during eclipse)’: South Abkhaz *a-t’ə́j^{o}* ‘monster swallowing sun or moon (during eclipse)’, *a-t’ə́j^{o}-k’-ra* ‘solar/lunar eclipse’; Bzyp *a-t’^{o}ə́j^{o}*, *a-t’^{o}ə́ja* ‘monster swallowing sun or moon (during eclipse)’; Ahchypsy *a-t’ə́j^{o}* ‘monster swallowing sun or moon (during eclipse)’. Note: Labialization in Bzyp and Ahchypsy may be secondary.

254. Proto-Indo-European **t’em-*/**t’om-*/**t’m̥-* ‘to grow, to increase’: Tocharian B *tsamo* ‘growing’, *tsmotstse* ‘growing, increasing’, *tsmoññe* ‘growth, increase’, *tsäm-* ‘to grow (in size or number)’. Perhaps also in Iranian (if from Proto-Indo-European **t’m̥H-s-* or **t’m̥H-k^{h}-* ‘to grow, to increase; to heap up, to accumulate, to collect’ > Proto-Iranian **dās-* >): Ossetic *dasun*, *dast* ‘to collect, to heap up’; Khotan Saka *dāsa-* ‘collection, heap’. Note: Adams (2013:804) derives the Tocharian forms from Proto-Indo-European **t’em(H)-*/**t’om(H)-*/**t’m̥(H)-* ‘to build’.

Northwest Caucasian: Common Abkhaz (reduplicated) **t’am-t’ámə* ‘plump, soft’: South Abkhaz *á-t’amt’am* ‘plump, soft’, *jə-t’amt’ám-wa* ‘soft (of dough, ripe fruit)’; Abaza/Tapanta *t’am-t’am* ‘stout, corpulent, plump; ripe (of soft, juicy fruit)’.

255. Proto-Indo-European (extended form) **t’er-b^{h}-*/**t’or-b^{h}-*/**t’r̥-b^{h}-* ‘to bend, to twist (together)’: Sanskrit *dṛbháti* ‘to string together, to arrange, to tie, to fasten’; Old English *tearflian* ‘to turn, to roll, to wallow’; Old High German *zerben* ‘to be twisted’.

Northwest Caucasian: (1) Common Abkhaz **t’arə́* ‘to be flexible, viscous, bending’: South Abkhaz *á-t’ar-ra* ‘to be flexible, viscous, bending’. (2) Common Abkhaz (reduplicated) **t’ərə́-t’ərə́* ‘tall and lithe, elegant (of man)’: Abzhywa (reduplicated) *á-t’ar-t’ar-ra* ‘tall and lithe, elegant (of man)’; Bzyp *á-t’ər-t’ər-ra* ‘tall and lithe, elegant (of man)’.

256. Proto-Indo-European **t'ew-*/**t'ow-*/**t'u-* 'to hit, to strike': Old Irish *dorn* 'fist', *·durni* 'to strike with fists'; Welsh *dwrn* 'fist'; Breton *dourn* 'hand'; Old Icelandic *tjón* 'damage, loss', *týna* 'to lose, to destroy, to put to death', (reflexive) *týnast* 'to perish', *týning* 'destruction'; Old English *tēona* 'injury, suffering, injustice, wrong, insult, contumely, quarrel', *tēonian* 'to irritate', *tīenan* 'to annoy, to irritate'; Old Saxon *tiono* 'evil, harm, injury, wrong, hostility, enmity', *gitiunian* 'to do wrong'; Latvian *dùre*, *dûris* 'fist', *duŕu*, *dũru*, *duřt* 'to sting, to thrust'.

Northwest Caucasian: Proto-Circassian **t'awə* 'to bump (one's head)': Temirgoy *ya-t'awə* 'to bump (one's head)'.

257. Proto-Indo-European (**t'er-*/)**t'or-*/**t'r-* 'to run, to flow' (unattested); (extended forms) (1) **t'r-eA-* [**t'r-aA-*] > **t'rā-*; (2) **t'r-em-*/**t'r-om-*/**t'r-m̥-*; (3) **t'r-ew-*/**t'r-ow-*/**t'r-u-* 'to run, to flow': Sanskrit *drā́ti* 'to run, to hasten', *drámati* 'to run about, to roam, to wander', *drávati* 'to run, to hasten', *dravá-ḥ* 'running, flowing', *dravantī* 'river', *druta-ḥ* 'speedy, swift'; Greek δρησμός 'flight, running away', (aor.) ἔδραμον 'to run, to move quickly', δρόμος 'course, running, race'; Gothic *trudan* 'to tread, to step'; Old Icelandic *troða* 'to tread'; Old English *tredan*, 'to tread, to step on, to trample', *treddian* 'to tread, to walk', *trod* (f. *trodu*) 'track, trace'; Old Frisian *treda* 'to tread'; Old Saxon *tredan* 'to tread'; Old High German *tretan* 'to tread', *trottōn* 'to run'.

Northwest Caucasian: (1) Proto-Circassian **t'ərza* 'to sport, to gambol (of a horse)': Temirgoy *t'ərza* 'to sport, to gambol (of a horse)'. (2) Proto-Circassian **t'ara* 'to sport, to gambol (of a horse)': Temirgoy *t'ara-n* 'to sport, to gambol (of a horse)'.

258. Proto-Indo-European **wel-*/**wol-*/**wl̥-* 'to turn, to roll, to revolve': Sanskrit *válati*, *válate* 'to turn, to turn around, to turn to'; Armenian *gelum* 'to twist, to press', *glem* 'to roll', *glor* 'round'; Greek εἰλέω (< **Ϝελ-ν-έω*) 'to roll up, to pack close, to wind, to turn around, to revolve', εἰλύω 'to enfold, to enwrap'; Latin *volvō* 'to roll, to wind, to turn around, to twist around'; Old Irish *fillid* 'to fold, to bend'; Gothic *agwalwjan* 'to roll away', *at-walwjan* 'to roll to'; Old Icelandic *valr* 'round', *velta* 'to roll', *válka* 'to toss to and fro, to drag with oneself', *válk* 'tossing to and fro (especially at sea)'; Old English *wielwan* 'to roll', *wealwian* 'to roll', *wealte* 'a ring', *wealcan* 'to roll, to fluctuate (intr.); to roll, to whirl, to turn, to twist (tr.)', *wealcian* 'to roll (intr.)', *gewealc* 'rolling', *welung* 'revolution (of a wheel)'; Middle English *walken* 'to walk, to roll, to toss', *walkien* 'to walk'; Middle Dutch *welteren* 'to roll', *walken* 'to knead, to press'; Old High German *walzan* 'to roll, to rotate, to turn about', *walken*, *walchen* 'to knead, to roll paste'; Tocharian B *wäl-* 'to curl'.

Northwest Caucasian: Proto-Circassian **waλa* 'to totter, to reel': Bžedux *wāλa* 'to totter, to reel'; Temirgoy *wāλa* 'wave; to undulate'.

259. Proto-Indo-European **yet^{h}-/*yot^{h}-* ‘to exert oneself, to endeavor, to strive’: Sanskrit *yátati*, *yátate* ‘to exert oneself, to endeavor; to make, to produce’, *yáti-ḥ* ‘a sage of subdued passions’, *yatná-ḥ* ‘effort, endeavor, exertion, energy, diligence, perseverance’; Avestan *yateiti*, *yatayeiti* ‘to strive after; to place in order’; Tocharian B *yāt-* ‘to be capable of; to have power over, to tame’.

Northwest Caucasian: Proto-Circassian **yat^{h}a* ‘to rage (of storm), to swell (of wound); to let oneself go, to become insolent’: Temirgoy *yāta* ‘to rage (of storm), to swell (of wound); to let oneself go, to become insolent’; Kabardian *yāta* ‘to rage (of storm), to swell (of wound); to let oneself go, to become insolent’.

XXIII. Northwest Caucasian Lexical Parallels to Proto-Indo-European Roots Subject to Root Structure Constraint Laws

Now, as noted in Chapter 4, Proto-Indo-European had constraints on permissible root structure sequences. In terms of the Glottalic Model of Proto-Indo-European consonantism, these root structure constraint rules may be stated as follows:

1. Each root had to contain at least one non-glottalic consonant.
2. When both obstruents were non-glottalic, they had to agree in voicing.

The Proto-Indo-European root structure constraint laws thus become merely a voicing agreement rule with the corollary that two glottalics cannot cooccur in a root. Comparison with the other Nostratic languages indicates, however, that the forbidden root types must have once existed. Two rules may be formulated to account for the elimination of the forbidden types:

1. A rule of progressive voicing assimilation may be set up to account for the elimination of roots whose consonantal elements originally did not agree in voicing: **T ~ *B > *T ~ *P*, **B ~ *T > *B ~ *D*, etc.
2. A rule of regressive deglottalization may be set up to account for the elimination of roots containing two glottalics: **C’VC’ > *CVC’*, etc.

The question then naturally arises as to precisely when these constraints first appeared in Proto-Indo-European. The contact between Proto-Indo-European with Northwest Caucasian that we have been exploring in this chapter may provide an answer to this question. Northwest Caucasian has the forbidden sequences, though, it should be noted that there are sporadic examples of regressive deglottalization in Northwest Caucasian as well, such as, for instance, Ashkharywa *k^{o}t’əw* ‘hen’ and Abaza/Tapanta *k^{o}t’əw* ‘hen’, with regressive deglottalization, as opposed to South Abkhaz *a-k’^{o}t’ə́* ‘hen’ and Sadz *a-k’^{o}ət’t’ɐ́* ‘hen’, without deglottalization. If lexical comparisons exist between Proto-Indo-European and Northwest Caucasian in which the forbidden root types are found, it would indicate that the root structure constraints must have developed in Proto-Indo-European after the period of contact

between Proto-Indo-European and Northwest Caucasian but before the individual Indo-European daughter languages began to develop. Specifically, this would be the Phonemic Pitch Stage of Proto-Indo-European (see the Appendix to Chapter 4 as well as Chapter 20 for details about the different stages of development in Proto-Indo-European). The following are possible lexical comparisons indicating that this is indeed the case:

A. Examples of regressive deglottalization (**C'VC'-* > **CVC'-*):

260. Proto-Indo-European **k'et'-/*k'ot'-* > (with regressive deglottalization) **kʰet'-/*kʰot'-* 'to strive, to make strenuous effort; to succeed, to triumph': Sanskrit *śad-* (perfect *śāśadúḥ*, participle *śā́śadāna-ḥ*) 'to cause to go, to impel, to drive on; to excel, to distinguish oneself, to triumph'. Perhaps also Old Icelandic *hetja* 'a hero, champion, gallant man'. Notes: (1) Distinct from *śad-* 'to fall, to fall off, to fall out' (cf. Mayrhofer 1956—1980.II:204—205). (2) Not related to Greek κέκασμαι (< *-καδ-) 'to surpass, to excel, to overcome' (cf. Kümmel 2000:512—514; Rix 2001:325 ? **k̂end-*, but **k̂ed-* is also possible).

Northwest Caucasian: Common Abkhaz **k'at'á* 'incessently, without stop': South Abkhaz *a-k'at'á-ħºa* 'incessently, without stop'.

261. Proto-Indo-European **k'ʷat'-* > (with regressive deglottalization) **kʷʰat'-* 'to cackle, to cluck': Lithuanian *kadù*, *kaděti* 'to cackle, to cluck'; Irish *cadhan* 'a wild goose, a barnacle-goose'. Note: Mann (1984—1987:1017) reconstructs Proto-Indo-European **q̱uad-* 'to cackle, to cluck'.

Northwest Caucasian: Common Abkhaz **k'ºət'ə́(w)* 'hen': Ashkharywa *kºt'əw* 'hen'; South Abkhaz *a-k'ºt'ə́* 'hen'; Sadz *a-k'ºət't'ə́* 'hen'; Abaza/Tapanta *kºt'əw* 'hen'. Note: Regressive deglottalization in Ashkharywa and Abaza/Tapanta.

262. Proto-Indo-European **k'ʷek'-/*k'ʷok'-* > (with regressive deglottalization) **kʷʰek'-/*kʷʰok'-* 'to disappear, to vanish, to wither': Common Slavic **čèznǫti* 'to disappear, to vanish' > Russian (dial.) *čéznut'* [чезнуть] 'to disappear, to vanish, to perish'; Polish *czeznąć* (obs.) 'to wither, to disappear, to vanish'; Bulgarian *čézna* 'to disappear, to vanish'. Perhaps also Old Icelandic *hvika* 'to quail, to shrink, to waver', *hvikan* 'a quaking, vavering', *hvikr* 'quaking', *hvikull* 'shifty, changeable'.

Northwest Caucasian: Proto-Circassian **k'ºak'ə* 'to change, to get spoiled': Bžedux *za-k'ºač''ə* 'to change, to get spoiled'; Kabardian *za-k'ºak'* 'to change, to get spoiled'. (*za-* 'to oneself'.)

263. Proto-Indo-European **p'ek'-/*p'ok'-* > (with regressive deglottalization) **pʰek'-/*pʰok'-* 'to be sleepy, tired' (only in Germanic): Proto-West Germanic

**fakan-* ‘to be sleepy, tired’, **fak(k)a-* ‘sleepy, tired’ > Middle Dutch *vaken* ‘to sleep’, *vake*, *vaec* ‘sleepiness’; Old Low Franconian *facon* ‘to sleep’; Middle Low German *vāk* ‘sleepiness’; Low German *fakk* ‘tired, weak’. Note: Kroonen (2013:124—125) reconstructs Proto-Germanic **fakk/gōn-* ‘to become sleepy’ and includes Modern English (*to*) *fag* ‘to tire, to become weary’, (obsolete) ‘to hang loose, to flap’ and Scottish English (*to*) *faik* ‘to fail from weariness; to cease moving’. However, English (*to*) *fag* is usually taken to be “of unknown origin. Weekley (1921:543), on the other hand, takes *fag* ‘drudge, weariness’ to be a “schoolboy perversion of *fatigue*”. However, this is rejected outright by Lieberman (2008:67—70) as “a product of etymological despair”. Lieberman further notes that the meanings ‘drudge’ and ‘weary’ are “late senses”. Thus, it appears that the English forms cited by Kroonen really do not belong here.

Northwest Caucasian: Proto-Circassian **Pq’a* ‘bed, bedding’: Bždeux *p’a* ‘bed, bedding’; Šapsegh *pq’a*, *p’a* ‘bed, bedding’.

264. Proto-Indo-European **p’ek’-/*p’ok’-* > (with regressive deglottalization) **p^{h}ek’-/*p^{h}ok’-* ‘interval, section, compartment, partition. division’ (only in Germanic): Proto-West Germanic **faka-* > Old English *fæc* ‘space of time, division, interval’; Old Frisian *fek*, *fak* ‘part of house, niche’; Middle Dutch *vac* ‘compartment, section’; Old High German *fah* ‘wall, compartment’. Note: Assuming derivation from an unattested verb **p^{h}ek’-/*p^{h}ok’-* ‘to strike, to split (apart), to break (apart), to divide’.

Northwest Caucasian: Common Abkhaz **p’q’a* ‘to beat, to strike’: Abzhywa *á-p’q’a-ra* ‘to beat, to strike’; Abaza/Tapanta *p’q’a-rá*, *bq’a-rá* ‘to beat, to strike, to slap; to thresh’, *bq’á-ga*, *p’q’á-ga* ‘thresher’; Bzyp *á-pq’a-ra* ‘to beat, to strike’.

265. Proto-Indo-European **p’et’-/*p’ot’-* > (with regressive deglottalization) **p^{h}et’-/*p^{h}ot’-* ‘to twist, to turn, to bend’: Old Icelandic *fattr* ‘(easily) bent backwards’, *fetta* ‘to bend back’; Greek πέδησις ‘a bending’. Perhaps also Tocharian B *peti* ‘flattery’ (if not an Iranian loanword [cf. Adams 2013:423—424]), assuming semantic development as in South Abkhaz cited below.

Northwest Caucasian: Common Abkhaz **p’at’á* ‘to entangle, to mat (of thread); to make confused (in the room); to intermix things’: Abaza/Tapanta *la-r-p’at’a-rá* ‘to entangle, to mat (of thread); to make confused (in the room); to intermix things’; South Abkhaz *a-p’at’a-rá* ‘to be delirious, to talk nonsense, to mix truth with lies, to lie’.

266. Proto-Indo-European **p’et’-/*p’ot’-* > (with regressive deglottalization) **p^{h}et’-/*p^{h}ot’-* ‘(vb.) to constrain, to restrain; to bind tight; to fetter, to shackle; (n.) fetter, shackle’: Greek (f.) πέδη ‘fetter, shackle’, (denominative) πεδάω ‘to bind with fetters; to shackle, to trammel, to constrain’, πεδόομαι ‘to be

impeded'; Latin *pedica* 'fetter, shackle; snare', *impediō* 'to hinder, to impede, to obstruct; to restrict the movement of (by hobbling, binding, entangling, etc.)'; Old Icelandic *fjötra* 'to fetter', *fjöttur* 'fetter, shackle'; Old English *feter*, *fetor* 'fetter. shackle', *feterian* 'to fetter, to bind'; Old High German *fezzara* 'fetter'; Hittite *patalli(ya)-* 'fetter (?), tether (?)'; Luwian *patalḫa(i)-* 'to fetter'. Note: Thus, not derived from or related to Proto-Indo-European **pʰet'-*/**pʰot'-* 'foot' as has sometimes been suggested.

Northwest Caucasian: Proto-Circassian **p'ət'a* 'to jam, to press, to pinch': Bždeduх *p'ət'a* 'to crush, to press', *da-p'ət'a* 'to jam, to pinch'; Kabardian *p'ət'* 'to crush, to press', *da-p'ət'a* 'to jam, to pinch'.

For the semantics, cf. Modern Greek σφίγγω 'to bind tight' also sometimes 'to press, to squeeze (especially the hand)' (cf. Buck 1949:9.342 press [vb.]).

267. Proto-Indo-European **p'et'-*/**p'ot'-* > (with regressive deglottalization) **pʰet'-*/**pʰot'-* 'to go, to move; to fall': Sanskrit *pádyati*, *-te* 'to fall down or drop with fatigue; to perish; to go, to go to; to attain, to obtain'; Old Icelandic *feta* 'to step'; Old English *fetan* 'to fall'; Old High German *fezzan*, *gi-fezzan* 'to fall'; Old Church Slavic *padǫ*, *pasti* / *padajǫ*, *padati* 'to fall'; Russian *pádat'* [падать], *past'* [пасть] 'to fall; to fall down, into, on, from; to drop, to drop down; to be degraded, ruined'. Note: Thus, not derived from or related to Proto-Indo-European **pʰet'-*/**pʰot'-* 'foot' as is sometimes suggested.

Northwest Caucasian:

A. Circassian: Kabardian *p'ăt'ăwă* 'to stir, to move'. Kabardian loanwords in: Ashkharywa *p'at'áw(a)-ra* 'to stir, to move'; Abaza/ Tapanta *p'at'áw-ra* 'to stir, to move'; Abzhywa *a-p'at'áw-ra* 'to stir, to move'.
B. Ubykh *p'at'awa-* 'to wriggle (about), to fidget'.

268. Proto-Indo-European (**t'ek'-*)/**t'ok'-* > (with regressive deglottalization) **tʰek'-*/**tʰok'-* 'to knock, to beat, to strike': Proto-Germanic **θek-*/**θak-* 'to knock, to beat, to strike' > Old Icelandic *þjaka* 'to thwack, to thump, to smite', *þjakaðr* 'worn, fainting, exhausted', *þjökka* 'to thwack, to thump, to beat, to chastise', *þykkr* (< **þjökk-* < **þekk-*) 'a thwack, thump, blow, a hurt'; Old English *þaccian* 'to clap, to pat, to stroke, to touch gently, to smack, to beat'; Middle English *þakken* 'to pat, to stroke'. Perhaps also: Sanskrit *tāják*, *tāját* 'suddenly, abruptly'; Tocharian B (adv.) *tetekā-* ~ *tetekāk* ~ *tetkāk* 'suddenly, immediately'; assuming semantic development as in Bzyp *á-t'əq'-ħ°a* 'quickly, instantly' cited below.

Northwest Caucasian:

A. Common Abkhaz **t'ə́q'ə* 'to knock, to beat': South Abkhaz *a't'ə́q'-ra* 'to beat unmercifully'; Bzyp *á-t'əq'-ħ°a* 'quickly, instantly'; Abaza/Tapanta *t'əq'-t'əq'* 'descriptive of a hollow knock, a tap'.

B. Ubykh *t'q'ada-* 'to strike, to hit'.

B. Examples of progressive voicing assimilation (**T* ~ **B* > **T* ~ **P*, **B* ~ **T* > **B* ~ **D*, etc.):

269. Proto-Indo-European **bʰetʰ-/*bʰotʰ-* > (with progressive voicing assimilation) **bʰedʰ-/*bʰodʰ-* 'to strike, to pierce; to fight', **bʰodʰ-wo-* 'battle, fight(ing), strife, war': Old Icelandic (poet.) *böð* 'battle', *böðull* 'executioner'; Norwegian *bøddel* 'executioner, hangman'; Old English *beadu*, *beado* 'battle, fighting, strife, war'; Old Saxon *badu-* 'battle'; Old High German *batu* 'battle'; Middle Irish *bodb*, *badb* 'crow; goddess of war'.

Northwest Caucasian: Proto-Circassian **wəbatʰa* 'to break': Bžedux *wəbatʰa-n* 'to break (for example, a plate) (tr.)'.

270. Proto-Indo-European **bʰetʰ-/*bʰotʰ-* > (with progressive voicing assimilation) **bʰedʰ-/*bʰodʰ-* 'hip, haunch, thigh': Old Church Slavic *bedra* 'thigh'; Russian *bedró* [бедро] 'hip, haunch; (medical) femur, thigh-bone'; Czech *bedra* (pl.) 'loins, hips'; Serbo-Croatian *bèdro* 'thigh'. Perhaps also Sanskrit (Vedic) *bādh-* in *jñu-bā́dh-* 'bending the knees'. Note: The original meaning of Proto-Indo-European **bʰedʰ-/*bʰodʰ-* may have been 'to be or become bent, crooked, twisted; to bend, to twist'.

Northwest Caucasian: Proto-Circassian **bət:ə* 'hunchbacked': Bžedux *bət:ə* 'hunchbacked'.

271. Proto-Indo-European **kʰebʰ-/*kʰobʰ-* > (with progressive voicing assimilation) **kʰepʰ-/*kʰopʰ-* 'stem, stalk, halm; grass, hay, straw' (only in Lithuanian): Lithuanian *šãpas* 'stem, stalk, halm, blade (of grass), straw; mote', *šápauti* 'to gather straw'. Derksen (2015:440) compares Sanskrit *śā́pa-ḥ* 'driftwood, drift, floating' here but prudently notes that this is "[a]n old, but highly uncertain etymology" (see also Mayrhofer 1956—1980.II:324 and 1986—2001.II:629 Proto-Indo-European **ḱóp-o-*).

Northwest Caucasian: Common Abkhaz **qə́-bə* 'roof, thatch': Bžedux *a-x̌ə́b* 'roof, roofing', *a-x̌ə́b-ra* 'to roof, to thatch'; Abzhywa *a-x̌ə́b-ra* 'to roof, to thatch'; Abaza/Tapanta *qə́b* 'roofing (material); hay roof', *qəb-ra* 'to roof, to thatch'.

272. Proto-Indo-European **pʰegʰ-/*pʰogʰ-* > (with progressive voicing assimilation) **pʰekʰ-/*pʰokʰ-* 'to hit, to beat, to strike': Old English *feohtan* 'to fight', *feoht* 'fighting, battle'; Old Frisian *fiuchta* 'to fight'; Old High German *fehtan* 'to fight' (New High German *fechten*); Tocharian B *pyāk-* 'to strike (downwards), to batter; to beat (a drum); to penetrate (as a result of a downward blow)'; Albanian *-pjek* in *përpjek* 'to hit, to knock, to strike'.

Northwest Caucasian: Proto-Circassian *$p^həg(a)$ ‘to butt, to gore’: Bždeux $p^həʒ'a$, *ya-*$p^həʒ'ə$ ‘to butt, to gore’; Kabardian *pəga*, *ya-pəg* ‘to butt, to gore’.

273. Proto-Indo-European *p^heg^h-/*p^hog^h- > (with progressive voicing assimilation) *p^hek^h-/*p^hok^h-, (adj.) *p^hok^h-*ró-s* ‘fair, beautiful’ (only in Germanic): Proto-Germanic **faɣraz* ‘fair, beautiful’ > Gothic **fagrs* ‘fitting, proper, suitable’; Old Icelandic *fagr* ‘fair, fine, beautiful’, *fegrð* ‘beauty’, *fegra* ‘to embellish, to beautify’; Modern Icelandic *fagur* ‘proud’; Norwegian (poet.) *fager* ‘beautiful, fair, handsome’, *fagna* ‘excellent, worthy’; Swedish *fager* ‘fair, pretty, fine, beautiful’; Old English *fæger* ‘fair, lovely, beautiful; pleasant, agreeable; attractive’; Old High German *fagar* ‘fair, beautiful’.

Northwest Caucasian:

A. Proto-Circassian *$p^haɣa$ ‘proud, arrogant, haughty’: Bždeux $p^hāɣa$ ‘proud, arrogant, haughty’; Kabardian *pāɣa* ‘proud, arrogant, haughty’. Circassian loanwords in Abkhaz: South Abkhaz *a-pág'a* ‘proud, arrogant, haughty’; Abaza/Tapanta *pág'a* ‘proud, arrogant, haughty’. Note: Kuipers (1975:10) writes Proto-Circassian *$p^haĝa$.
B. Ubykh *pağá* or *pa:ğá* ‘proud’.

Note: Proto-Circassian *$ɣ$ = Proto-Indo-European *g^h (> *k^h in the above example, due to progressive voicing assimilation).

274. Proto-Indo-European *p^heg^h-/*p^hog^h- > (with progressive voicing assimilation) *p^hek^h-/*p^hok^h- ‘to satisfy, to please; to be joyful, happy, pleased, satisfied; to rejoice’ (only in Germanic): Gothic *faginōn* ‘to rejoice’, *fulla-fahjan* ‘to satisfy, to serve’, *fahēþa* ‘gladness, joy’, *ga-fēhaba* ‘satisfactorily, properly’ (?); Old Icelandic *fagna* ‘to rejoice’, *fagnaðr* ‘joy’, *feginn* ‘glad, joyful’; Old English *fægen* ‘glad, joyful, rejoicing’, *ge-fēon*, *ge-feohan* ‘to be glad, to rejoice, to exult’; Old High German *gi-fehan* ‘to rejoice’, *gi-feho* ‘joy’.

Northwest Caucasian: Common Abkhaz **pə-gá-la* ‘to bring something for somebody who is going to be met’: South Abkhaz *a-p-gá-la-ra* ‘to bring something for somebody who is going to be met’, *a-p-gá-la* ‘luck, success’; Abaza/Tapanta *p-ga-l-ra* ‘to bring something for somebody who is going to be met’.

275. Proto-Indo-European *t^heg^{wh}- > (with progressive voicing assimilation) *t^hek^{wh}- in *t^hek^{wh}-*mén*- ‘a kind of disease’ (Sanskrit only): Sanskrit *takmán*-(-*ā́*) ‘a kind of disease, or probably, a whole class of diseases, accompanied by eruptions of the skin’. Note: Tocharian B *teki* ‘disease, illness’, *tekiññe* ‘sick, diseased’, *tekīta* ‘a sufferer, patient, sick person (?)’ may belong here as well, assuming development from Proto-Indo-European *t^hok^{wh}-.

Northwest Caucasian: Common Abkhaz **tágᵒə* ‘swelling of neck’s glandule’: Bzyp *a-tágᵒ* ‘swelling of neck’s glandule’.

Note: The Abkhaz forms cited above are taken from Chirikba 1996b, and the Circassian froms are from Kuipers 1975. Several other works have also been consulted (such as Tuite—Schulze 1998). The Indo-European material is taken from the standard etymological dictionaries listed in the references (volume 4), with heavy reliance on the etymological work currently being done by a group of scholars in Leiden, The Netherlands (Beekes 2010; Boutkan—Siebinga 2005; Cheung 2007; De Vaan 2008; Derksen 2008 and 2015; Kloekhorst 2008b; Kroonen 2013; Martirosysan 2008; and Matisović 2009; also Bomhard 2008e as part of the same series).

21.6. THE ORIGIN OF THE HETEROCLITIC NOMINAL DECLENSION IN PROTO-INDO-EUROPEAN

In Proto-Indo-European, there was a special, and rather unusual, type of declension in which the nom.-acc. sg. was characterized by **-r-*, while the remaining cases were characterized by an **-n-*, which replaced the **-r-* and which was found between the stem and the case endings. Nouns exhibiting this patterning are known as “heteroclitic stems”. Though common in Hittite, this declensional type was in decline in the other daughter languages (cf. Fortson 2010:123 and 181—182; Kloekhorst 2008b:108—109). For details on heteroclitic nominal stems, cf. Burrow 1973:226—229; Szemerényi 1996:173. The following table illustrates the general patterning of these stems, citing just the nominative and genitive cases (here, the traditional transcription of Proto-Indo-European has been retained as opposed to the Glottalic Model of Proto-Indo-European consonantism used throughout this book):

	Nominative Singular	Genitive Singular
Hittite	*wa-a-tar* ‘water’	*ú-i-te-na-aš*
	pa-aḫ-ḫur, *pa-aḫ-ḫu-wa-ar* ‘fire’	*pa-aḫ-ḫu-e-na-aš*
	e-eš-ḫar, *e-eš-ḫa-ar*, *iš-ḫar* ‘blood’	*iš-ḫa-na-aš*
	ut-tar ‘word, affair’	*ud-da-na-aš*
	me-ḫur ‘time’	*me-(e-)ḫu-na-aš*
Sanskrit	*yákṛt* ‘liver’	*yaknás*
	áhar ‘day’	*ahnás*
	ū́dhar ‘udder’	*ū́dhnas*
	ásṛk ‘blood’	*asnás*
	śákṛt ‘dung’	*śaknás*
Greek	ὕδωρ ‘water’	ὑδατός (< **ud-n̥-to-s*)
	οὖθαρ ‘udder, breast’	οὔθατος (< **ōudh-n̥-to-s*)

Latin	*femur* ‘thigh’	*feminis* (also *femoris*)
	iecur ‘liver’	*iocineris* (also *iecoris*)

Notes:
1. The *-t* and *-k* that have been added to the nom. sg. in Sanskrit are innovations.
2. In Greek, -το- has been added to the “oblique-*n*”, which is in the reduced-grade (*-*n̥*- > -α-).
3. Heteroclitic stems are neuter in gender (cf. Schindler 1975).

That this is an ancient declensional type has long been recognized (cf. Kapović 2017c:77—78), though its origin has heretofore not found an acceptable explanation, some previous attempts notwithstanding. Perhaps, the prehistoric language contact between Northwest Caucasian and Proto-Indo-European that we have been exploring in this chapter may provide clues concerning the origin of the heteroclitic nominal declension in Proto-Indo-European. Let us take a look.

Compared to the complex declension system found in Proto-Indo-European, nominal declension was relatively simple in Northwest Caucasian.

According to Arkadiev—Lander (to appear, pp. 17—25), gender is found only in Abkhaz and Abaza, with the main distinguishing feature being between human as opposed to non-human. Moreover, there is no gender agreement of noun modifiers in these languages.

Two numbers are differentiated in Northwest Caucasian, an unmarked singular and a marked plural. There is no dual. Abkhaz and Abaza also have collective suffixes. In Kabardian, the plural is consistently marked with the suffix *-xe* (see the table of grammatical case markers, as well as note 4, on the following page).

Another feature common to all of the Northwest Caucasian languages is the use of personal prefixes on nouns to express adnominal possession. The possessive prefixes found in Abaza, Ubykh, and West Circassian are listed in a table (4.2) in Arkadiev—Lander (to appear, p. 18).

Grammatical cases are missing in Abkhaz and Abaza, while only two cases are distinguished in Ubykh and Circassian, namely, (1) the absolutive and (2) the oblique. The absolutive case is often called “ergative”, though Arkadiev—Lander (to appear, p. 22) point out that this term is misleading. In Ubykh, the absolutive case is unmarked in both singular and plural. However, both West Circassian and Kabardian mark the absolutive singular by the suffix *-r*, while, in the plural, the *-r* is appended after the suffix *-xe*, yielding *-xe-r*. Ubykh marks the oblique case by *-n* in the singular and *-ne* in the plural. Finally, West Circassian and Kabardian mark the oblique case by *-m* in the singular, while, in the plural, the *-m* is appended after the suffix *-xe*, yielding *-xe-m* (West Circassian also has *-me* and *-xe-me*, which are clearly innovations).

The following table summarizes the Ubykh, West Circassian, and Kabardian grammatical case markers (this table is adapted from table 4.3 in Arkadiev—Lander to appear, p. 22; see also Hewitt 2005b:103):

		Ubykh	West Circassian	Kabardian
Singular	Absolutive	*Ø*	*-r*	*-r*
	Oblique	*-n*	*-m*	*-m*
Plural	Absolutive	*Ø*	*-xe-r*	*-xe-r*
	Oblique	*-ne*	*-xe-m, -me, -xe-me*	*-xe-m*

Notes:
1. According to Chirikba (1996a:368), the Ubykh oblique marker *-n* is related to the Common Abkhaz locative suffix **-nə*. Chirikba (2016:19) further compares the Proto-Northwest Caucasian locative suffix **-na/ə* with the Proto-Northeast Caucasian genitive suffix **-n*.
2. Chirikba (2016:19) compares the oblique marker *-m* found in West Circassian and Kabardian with the Proto-Northeast Caucasian oblique marker **-m*.
3. For more information about noun morphology in Northwest Caucasian, cf. Hewitt 2005b:102—103. On ergativity in Northwest Caucasian, cf. Matasović 2012b:15—17.
4. The /x/ found in the Kabardian plural forms in the above table is actually /h/ (personal communication from John Colarusso).

As mentioned above, in the Proto-Indo-European heteroclitic declension, the nom.-acc. sg. was characterized by **-r-*, while the oblique cases in the singular were characterized by **-n-*, which replaced the **-r-* and which was found between the stem and the case endings. Quite interestingly, the oblique marker **-n-* found in the Proto-Indo-European heteroclitic declension matches the oblique marker **-n* found in Ubykh in both form and (partially) function, while the **-r-* found in the nom.-acc. sg. in the Proto-Indo-European heteroclitic declension matches the absolutive marker *-r* found in West Circassian and Kabardian in both form and (partially) function. Concerning the functions of the absolutive and oblique cases in Northwest Caucasian, Arkadiev—Lander (to appear, p. 22) state:

> On the functional side, there is considerable asymmetry in the distribution of the grammatical cases. The absolutive is restricted to marking the S of intransitive verbs (4.17a) and P of transitive verbs (4.17b). The oblique, by contrast, covers a very wide range of grammatical roles, including the ergative A of transitive verbs (4.18a), indirect objects introduced by specialized applicative prefixes (4.18d), adnominal posssessors (4.18e) and objects of postpositions (4.18f), and certain locative and temporal adjuncts (4.18g).

Thus, considering that there is already strong evidence for prehistoric language contact between Proto-Indo-European and Northwest Caucasian in the form of the 275 lexical parallels listed in this chapter, we can speculate that the underlying pattern of **-r-* in the nom.-acc. sg. and **-n-* in the singular oblique cases in the Proto-Indo-European heteroclitic declension was borrowed by Proto-Indo-European from Northwest Caucasian. The regular oblique case endings found in Proto-Indo-European (cf. Chapter 19, §19.4, for details) were eventually appended after the

oblique marker *-*n*-, thus yielding the heteroclitic declension of traditional Proto-Indo-European grammar.

Here, it is worth quoting Matasović's (2012b:19—20) remarks regarding the heteroclitic declensions in Proto-Indo-European and *Northeast* Caucasian:

> One of the most salient features of NE Caucasian inflection, attested in all branches of that family, is the two-stem inflection of nouns. One stem is used for the nominative (absolutive) case, whereas the other is used for the ergative and other oblique cases (Kibrik 1991). This is strongly reminiscent of the 'heteroclitic' inflection of the PIE neuters, which form the nominative and accusative singular with the stem ending in *-r, and the oblique cases with the stem ending in *-n, cf., e.g., PIE *yēkʷr (NOM and ACC SG) vs. *yekʷns (GEN SG) 'liver', cf. Gr. *hēpar*, *hḗpatos*, Lat. *iecur*, *iecinis*, IEW 504. Although heteroclitic stems are an archaism in most IE languages, in Anatolian they are quite productive, which testifies that, at least in Early PIE, they were quite common.
>
> This type of inflection is otherwise rare in the languages of North and Northeastern Eurasia, so its occurrence in PIE and NE Caucasian appears even more important. Note that it is at present impossible to reconstruct complete nominal paradigms in Proto-NE Caucasian, and that formal means of expression of the two-stem opposition differ in various languages (Alekseev 2003), but several different suffixes used to form the oblique stem can be posited; in Chechen, for example, the oblique stem can be formed with the nasal suffix. Thus, we have Chechen *buhʕa* 'owl' (Absolutive SG) vs. *buhʕ-an-uo* (Ergative), *buhʕ-an-ash* (Absolutive Plural), or Dargi *neš* 'mother', oblique *neš-li* (dative *neš-li-s*), plural *neš-ani*, oblique plural *neš-an-a-* (dative *neš-an-a-s*). After discussing the evidence, Alekseev (2003: 34) concludes that the heteroclitic inflection of this type is original in the NE Caucasian family.
>
> The fact that two-stem inflection is a trait shared exclusively by PIE and NE Caucasian is areally highly significant. However, one has to bear in mind that in PIE only neuters showed this feature, while in NE Caucasian it is attested across the lexicon.

But there is more. As opposed to Ubykh, the West Circassian and Kabardian oblique marker is *-m*. In Proto-Indo-European, the accusative singular case ending is *-*m* (*-*o-m* in thematic stems, *-*m̥*/-*m* in athematic stems). Here, we can speculate that the borrowing was in the opposite direction, namely, from Proto-Indo-European into Northwest Caucasian. From there, it passed into Northeast Caucasian as well.

One additional point needs to be made: Syntactic alignment is not considered in this section. Later Proto-Indo-European unquestionably had nominative-accusative alignment, while modern Northwest Caucasian languages have ergative alignment. According to some scholars, Proto-Indo-European may also have had ergative alignment at an earlier stage of development, while, according to other scholars, Proto-Indo-European may have had active alignment instead at an earlier stage of

development. Regarding ergativity in Northwest Caucasian, Matasović (2012:17) notes: "The ergative case marking on nouns in Ubykh and Circassian is a clear innovation".

A particularly noteworthy example here of borrowing by Proto-Indo-European from Northwest Caucasian involving a heteroclitic nominal stem in Proto-Indo-European is the word for 'blood':

> Proto-Indo-European (nom.-acc. sg.) **ʔés-ħ͡ħ-r̥*; (gen. sg.) **ʔs-ħ͡ħ-én-s*, **ʔs-ħ͡ħ-n-és* (**ʔ* = **ḫ₁*; **ħ͡ħ* = **ḫ₂*): Hittite (nom.-acc. sg.) *e-eš-ḫar*, *e-eš-ḫa-ar*, *iš-ḫar* 'blood', (gen. sg.) *iš-ḫa-na-a-aš*, *iš-ḫa-a-na-aš*, *iš-ḫa-na-aš*, *e-eš-ḫa-na-aš*, etc.; Cuneiform Luwian (nom.-acc. sg.) *a-aš-ḫar-ša*, [*a-*]*aš-ḫa-ar* 'blood', (nom. sg.) *a-aš-ḫa-nu-wa-an-ti-iš* 'bloody'; Hieroglyphic Luwian (nom.-acc. sg.) *á-sa-ha-na-ti-sa-za* 'blood-offering'; Sanskrit (nom.-acc. sg.) *ásṛk* 'blood', (gen. sg.) *asnás*; Greek ἔαρ, εἷαρ (Hesychius ἦαρ) 'blood'; Armenian *ariun* 'blood'; Old Latin *as(s)er* 'blood'; Latvian *asins* 'blood'; Tocharian A *ysār*, B *yasar* 'blood'. The Proto-Indo-European root is obviously **ʔes-*/**ʔs-*, which has been extended by a suffix **-ħ͡ħ-* (cf. the *-χ-* in the Ubykh forms cited below), yielding the stem **ʔes-ħ͡ħ-*. The nom.-acc. sg. ends in **-r*, while the oblique cases contain an oblique marker in **-n-*, thus: Proto-Indo-European (nom.-acc. sg.) **ʔés-ħ͡ħ-r̥*; (gen. sg.) **ʔs-ħ͡ħ-én-s*, **ʔs-ħ͡ħ-n-és*. This is exactly what we would expect had this word been borrowed by Proto-Indo-European from Northwest Caucasian.
>
> Northwest Caucasian:
> A. Common Abkhaz **š'a* 'blood': South Abkhaz *a-š'á* 'blood', *a-š'a-rá* 'bleeding, bloody flux', *a-š'a-ba-rá* 'to bleed heavily'; Ashkharywa *š'a* 'blood'; Abaza/Tapanta *š'a* 'blood'. No doubt related to: Common Abkhaz **š'ə* 'to kill': South Abkhaz *a-š'-rá* 'to kill'; Abaza/Tapanta *š'-ra* 'to kill (imper. *d-š'ə* 'kill him/her!' [human]).
> B. Ubykh *š'χa-* 'to wound' (*asš'χán* 'I wound him'), *š'χaq'á* (def. *á-*) 'wound; wounded'.
>
> Note: The *š'* found in the Abkhaz and Ubykh forms cited above is represented as **s* in Proto-Indo-European.

Other examples of Proto-Indo-European heteroclitic noun stems with possible lexical parallels in Northwest Caucasian include the following:

1. Proto-Indo-European (nom.-acc. sg.) **yékʷʰ-r̥* 'liver', (gen. sg.) **yekʷʰ-n-és*, **yokʷʰ-én-s*, **yékʷʰ-n̥-s*, etc. (cf. Wodtko—Irslinger—Schneider 2008:393) (< **'entrails', as in Old Church Slavic *jętro* 'liver' ~ Greek ἔντερα 'entrails' [cf. Buck 1949:§4.45 liver]): Sanskrit (nom.-acc. sg.) *yákṛt* 'liver', (gen. sg.) *yaknás*; Avestan (nom.-acc. sg.) *yākarə* 'liver'; Greek (nom.-acc. sg.) ἧπαρ 'liver', (gen. sg.) ἥπατος; Latin (nom.-acc. sg.) *iecur* 'liver', (gen. sg.) *iecuris*, *iecinoris*; Lithuanian (dial.) (pl.) *jẽknos* 'liver'.

Northwest Caucasian: Proto-Circassian *$yaq^{h^o}ə$ ‘cud, entrails’: Bždux $yaq^{h^o}ə$ ‘cud, entrails’; Kabardian yaq^o ‘cud, entrails’.

2. Proto-Indo-European (nom.-acc. sg.) *$p^hét^h$-$r̥$ ‘wing, feather’, (gen. sg.) *p^het^h-*n-és* (only in Hittite as a productive heteroclitic stem): Hittite (nom.-acc. sg.) *pát-tar* ‘wing’, (dat.-loc. pl.) *pad-da-na-aš* (OH/NS), *pat-ta-na-aš* (NH). For more information, cf. Kloekhorst 2008b:658—659. Related noun forms include: Sanskrit *pátram* ‘wing, feather’; Greek πτερόν ‘feather, bird’s wing’; Old Icelandic *fjöðr* ‘feather, quill’; Old English *feþer* ‘feather’, (pl.) *feþra* ‘wings’; Old Frisian *fethere* ‘feather’; Old Saxon *fethara* ‘feather’; Old High German *fedara* ‘feather’, *fettāh* ‘wing’. Verb forms include: Hittite (3rd pl. pres.) *pít-ti-(ya-)an-zi* ‘to flee, to fly, to hasten’; Sanskrit *pátati* ‘to fly, to soar, to rush on; to fall down or off; to set in motion, to set out on foot; to rush on, to hasten’, (causative) *patáyati* ‘to fly or move rapidly along, to speed’; etc.

   Northwest Caucasian: Common Abkhaz (reduplicated) *pat-$pátə$: South Abkhaz *a-pat-pát-ra* ‘to flutter, to quiver (of bird); to flounder, to wallow’; Bzyp *a-pat-mát-ra* ‘to flutter, to quiver (of bird); to flounder, to wallow’.

3. Proto-Indo-European (nom.-acc. sg.) *$ʔyéʔ$-$r̥$- ‘year’, (gen. sg.) *$ʔyeʔ$-*én-s* (*$ʔ$ = *$ḫ_1$): Gothic *jēr* ‘year’; Old Icelandic *ár* ‘year’; Old English *ǥēar* ‘year’; Old Frisian *jēr* ‘year’; Old High German *jār* ‘year’; Avestan (nom.-acc. sg.) *yārə* ‘year’, (gen. sg.) *yå̊* (< *$ʔyeʔ$-*én-s*). Note: Heteroclitic declension is only attested in Avestan. Related verb forms include: Greek (1st sg. pres.) εἶμι ‘I go’, (1st pl. pres.) ἴμεν ‘we go’; Sanskrit (1st sg. pres.) *émi* ‘I go’, (3rd sg. pres.) *éti* ‘goes’, (1st pl. pres.) *imáḥ* ‘we go’, (3rd pl. pres.) *yánti* ‘they go’, (3rd sg. pres.) *yā́ti* ‘goes, moves, rides’; Latin (1st sg. pres.) *eō* ‘I go’; Old Lithuanian (3rd sg. pres.) *eĩti* ‘goes’; Old Prussian (3rd sg. pres.) *ēit* ‘goes’, *per-ēit* ‘comes’; Old Church Slavic *idǫ*, *iti* ‘to go’; Luwian (3rd sg. pres.) *i-ti* ‘goes’; Hittite (imptv.) *i-it* ‘go!’; Tocharian A (1st pl.) *ymäs* ‘we go’, B (1st sg.) *yam*, *yaṁ* ‘I go’.

   Northwest Caucasian: Common Abkhaz *$jə$: Abaza/Tapanta *ĥá-j-ra* ‘to come’, *na-j-ra* ‘to go’ (*na-* ‘thither’); South Abkhaz *aá-j-ra* ‘to come’, *a-ná-j-ra* ‘to go’.

4. Proto-Indo-European (nom.-acc. sg.) *$p^hé\underset{\smile}{ḫḫ}$-*ur-* [*$p^há\underset{\smile}{ḫḫ}$-*ur-*], *$p^he\underset{\smile}{ḫḫ}$-*wór-* [*$p^ha\underset{\smile}{ḫḫ}$-*wór-*] ‘fire’, (gen. sg.) *$p^he\underset{\smile}{ḫḫ}$-*w-én-s* [*$p^ha\underset{\smile}{ḫḫ}$-*w-en-s*], etc. (*$\underset{\smile}{ḫḫ}$ = *$ḫ_2$) (cf. Wodtko—Irslinger—Schneider 2008:540—545): Hittite (nom.-acc. sg.) *pa-aḫ-ḫu-ur*, *pa-aḫ-ḫu-wa-ar*, *pa-aḫ-ḫur* ‘fire’, (gen. sg.) *pa-aḫ-ḫu-e-na-aš*; Luwian (nom. sg.) *pa-a-ḫu-u-ur* ‘fire’; Greek πῦρ ‘fire’; Umbrian *pir* ‘fire’; Gothic *fōn* ‘fire’, (gen. sg.) *funins*; Old Icelandic *fúrr* ‘fire’, *funi* ‘flame’; Old English *fȳr* ‘fire’; Old Saxon *fiur* ‘fire’; Old High German *fiur*, *fuir* ‘fire’; Tocharian A *por*, B *puwar* ‘fire’; Old Czech *púř* ‘glowing ashes, embers’; Armenian *hur* ‘fire’.

Northwest Caucasian:

A. Proto-Circassian **Pxˇaq:ºa* ‘torch’: Kabardian *pxˇāq'ºa* ‘torch’.
B. (1) Common Abkhaz **pxˇa*: Abaza/Tapanta *pxˇa-rá* ‘to warm up, to become warm’; South Abkhaz *a-pxˇá* ‘warm’, *a-pxˇa-ra* ‘to warm up, to become warm; to shine (of sun, moon)’. (2) Common Abkhaz **pxˇ-ʒə́* (< **pxˇa* ‘warm’, **ʒə* ‘water’): South Abkhaz *a-pxˇ-ʒə́* ‘sweat’; Abaza/Tapanta *pxˇ-ʒə* ‘sweat’. (3) Common Abkhaz **pxˇə-nə́* (< **pxˇa* ‘warm’, **-nə* ‘season, time of’): South Abkhaz *a-pxˇə-n* ‘summer’; Ashkharywa *a-pxˇə-n-ra* ‘summer’; Abaza/Tapanta *pxˇ-nə* ‘summer’, *pxˇən-č'ə́l'a* ‘July; middle of summer’.

Note: Proto-Indo-European **pʰVh̯h-* = Common Abkhaz **pxˇV-*.

One of the tests of the validity of any theory is its ability to explain, in a straightforward and convincing manner, problems that have previously resisted all attempts at explanation. Here, we have just such a case — the possible explanation of the origin of the Proto-Indo-European heteroclitic nominal declension on the basis of prehistoric language contact between Proto-Indo-European and Northwest Caucasian.

21.7. CONCLUDING REMARKS

I believe that Colarusso’s work has great merit, though, as pointed out above, not all of his proposals are convincing. However, rather than view these similarities as evidence of genetic relationship, I prefer to see them as evidence that there was prolonged and substantial contact between Proto-Indo-European and Northwest Caucasian. As a result of the socio-cultural interaction with and resultant borrowing from Caucasian languages, especially primordial Northwest Caucasian languages, Proto-Indo-European developed unique characteristics that set it apart from the other Eurasiatic languages. Though Proto-Indo-European remained a Eurasiatic language at its core (cf. Collinder 1934, 1954, 1967, and 1970; Čop 1970a and 1975; Greenberg 2000—2002; Hyllested 2009; J. C. Kerns 1967; Kloekhorst 2008a; Kortlandt 2010a [various papers]; Pisani 1967; Ringe 1998a; Rosenkranz 1966; Uesson 1970; etc.), the interaction with Northwest Caucasian had a profound impact on the phonology, morphology, and lexicon of Proto-Indo-European (technically, this is known as “contact-induced language change”) and gave it a distinctive, Caucasian-like appearance (Kortlandt 2010f expresses a similar view).

But, there is more. One of the most significant byproducts of the comparison of Proto-Indo-European with Northwest Caucasian is that it provides empirical support for the Glottalic Model of Proto-Indo-European consonantism as well as the interpretation of the traditional plain voiceless stops as voiceless aspirates. Though we cannot say for certain on the basis of this comparison whether voiced aspirates existed in Proto-Indo-European at the time of contact with primordial Northwest Caucasian languages, there is nothing to indicate that they did. Indeed, the most straightforward explanation is that voiced aspirates arose at a later date in the

Disintegrating Indo-European dialects that gave rise to Indo-Iranian, Armenian, Greek, and Italic.

Another important insight that can be gleaned from this comparison is that the Pre-Proto-Indo-European morphological system changed dramatically as a result of contact with Northwest Caucasian languages — in certain respects, it became more complicated. At the same time, some of the earlier morphology must have been lost. In his 2002 book entitled *Pre-Indo-European*, Winfred P. Lehmann suggested that three endings represented the most ancient layer of the Proto-Indo-European case system — these endings were: **-s*, **-m*, and **-H*. According to Lehmann, **-s* indicated an individual and, when used in clauses, identified the agent; **-m* used in clauses indicated the target; and **-H* (= **$_{2_4}$* [see Chapter 19, §19.6]) supplied a collective meaning. Lehmann further maintains that the remaining case endings were based upon earlier adverbial particles that came to be incorporated into the case system over time. That this has indeed taken place is especially clear in the case of the dual and plural endings in **-b^hi-* and **-mo-*, which were incorporated into the Proto-Indo-European case system after Hittite and the other Anatolian daughter languages had split from the main speech community. The comparison with Northwest Caucasian indirectly corroborates Lehmann's views, though details of how and when the individual case endings traditionally reconstructed for Proto-Indo-European arose still need to be fully worked out — it may be noted that a good start has recently been made in this direction by the Czech scholar Václav Blažek (2014) and, before him, by Balles (2004), Beekes (1985), Haudry (1982), Ronald Kim (2012), Kulikov (2011), Kuryłowicz (1964a), Shields (1982), and Specht (1944), among others. See also Pooth 2018b for a radical reinterpretation of the case-marking system of Proto-Indo-European.

For corroborating evidence from archeology and genetics for language contact on the steppes, cf. Shishlina 2013 and Wang etal. 2019.

No doubt, as pointed out by Polomé (1990b), the Indo-Europeans must have come into contact with and replaced other non-Indo-European languages as they moved into and conquered central, southern, and western Europe. Basque is the sole non-Indo-European language to have survived from before the arrival of the Indo-Europeans to the present day (cf. Tovar 1970). On contacts between Proto-Indo-European and Proto-Uralic/Proto-Finno-Ugrian, cf. Kronasser 1948; Carpelan—Parpola—Koskikallio 2002; Jacobsohn 1980; Joki 1973; Kudzinowski 1983; Rédei 1983 and 1988c; Szemerényi 1988. For Kartvelian contacts, cf. Fähnrich 1988; Klimov 1985, 1991, and 1994a; Djahukyan 1967. Mention should also be made here of the theories advanced by Theo Vennemann (2003), according to which Indo-European speakers came into contact with and either substantially reduced or outright replaced Vasconic (that is, Pre-Basque) and Semitic languages in Western Europe. For remarks on substrate influence on the vocabulary of Northwest Indo-European, cf. Salmons 1992a. For an excellent overview of language contact in general, cf. Henning Andersen (ed.) 2003, the first section of which is devoted to Indo-European. Andersen's own contribution to the volume (pp. 45—76) deals with early contacts between Slavic and other Indo-European dialects, while that of Mees (pp. 11—44) deals with the substrata that underlie the Western branches of Indo-

European. Farther afield, Forest (1965:136) even lists several possible Indo-European loanwords in Chinese.

Next, it should be mentioned that Arnaud Fournet has brought to my attention a large number of non-Indo-Iranian Indo-European elements in Hurro-Urartian.

Finally, as made clear by Vajda in his review (2003) of Angela Marcantonio's book *The Uralic Language Family: Facts, Myths and Statistics* (2002), language contact ("extensive areal contact mutually as well as with non-Uralic languages") also appears to have played a significant role in the development of both Proto-Uralic itself as well as the various Uralic branches and sub-branches. However, unlike Marcantonio, Vajda considers Uralic to be a valid genetic grouping. To a large extent, it is the contact-induced language change that both Proto-Uralic and Proto-Indo-European have undergone that has made it so difficult to establish a convincing genetic relationship between these two language families.

References:

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